



MINISTRY OF FISHERIES
Te Tautiaki i nga tini a Tangaroa

A guide to common **deepsea invertebrates** in New Zealand waters



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A guide to common deepsea invertebrates in New Zealand waters

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PREFACE

Worldwide, there is increasing concern about the effects of fishing, not only on fishstocks, but also other species caught incidentally during fishing, such as invertebrates that live on the sea floor, and small organisms encountered in midwater. Although these animals are not part of New Zealand's Quota Management System, Ministry of Fisheries observers, and researchers conducting Ministry of Fisheries research surveys, are required to keep catch records of all species, including those caught incidentally. Many of the invertebrates are not readily identifiable at sea, and the result has been variable record-keeping on an ad hoc basis. The Ministry of Fisheries commissioned this pictorial identification guide to enable observers and researchers to recognise these organisms more easily, and improve the standard of catch records of incidentally caught species.

The guide provides identification sheets of over 100 invertebrate species, each with a colour image and a description of the key diagnostic features and known distribution, both by depth and geographic location. Taxonomic experts have had direct input to each section, and reference to the principal scientific literature is given on individual sheets. Most of the species in the guide are often encountered in deepwater fishing (deeper than 200 m. The guide brings together the knowledge and expertise gained by marine scientists during the last 30 years of research in New Zealand waters.

It is envisaged that the guide will become an essential tool for Ministry of Fisheries observers and researchers, and will also be useful to any others involved in identification of organisms at sea.

With more accurate identification, trends in the capture and distribution of non-fish bycatch can be better monitored, and this is seen as an important step towards fulfilling the environmental requirements of the Fisheries Act 1996.

Pamela Mace
Chief Scientist
Ministry of Fisheries, May 2005

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All images are NIWA copyright. We thank P. Marriott, D. Stevens, R. Stewart, and P. Shearer (NIWA), for providing several images for the guide. Cedric d’Udekem approved use of the amphipod image (*Eurythenes gryllus*). D. Fisher (NIWA) and A. McKinnon (Ministry of Fisheries) allocated the new Ministry of Fisheries species codes required. The “*species*” database used to produce the guide sheets was funded independently of this project by NIWA (NSOF project NNRC043 “Species ID tools”).

We also thank the Ministry of Fisheries, particularly S.M. Waugh, for supporting the work on the guide and this publication, and M.E. Livingston (Ministry of Fisheries) and M.F. Beardsell (NIWA) for their comprehensive reviews.

PURPOSE OF THE GUIDE

In New Zealand, invertebrates caught on or close to the bottom (termed benthic in this guide) are identified and weighed by observers or researchers on board commercial and research trawlers. Because identification is difficult, recording of invertebrate catch at sea has been ad-hoc, with identification of less common species relying heavily on preservation of specimens at sea, and later examination by experts onshore.

This guide will enable observers and researchers to identify the more common organisms while at sea, thereby streamlining the process of recording bycatch species. Over 100 benthic invertebrate taxa caught in New Zealand waters are included in the guide (Table 1). The guide provides images of each taxon, written descriptions of the main diagnostic features and details that allow them to be distinguished from similar or closely related organisms. The format of the guide is broadly compatible with the Observer Biological Data Collection manual and a separate guide to crab species.*

Data for each individual taxon are stored in NIWA’s relational “*species*” database. Automatic extraction routines select the appropriate information from the database and format the guide sheets.

ORGANISATION OF THE GUIDE

Phyla in the sheets and in Table 1 are arranged in conventional phylogenetic order, from structurally and anatomically less advanced groups (sponges), to the more advanced (echinoderms and tunicates). Each phylum is colour coded to assist with finding the appropriate sheets.

A pictorial guide and general description of each phylum is given (pages 9–18). This will assist users to distinguish the phyla, as well as their classes and orders, and to place organisms in the correct higher taxon.

The identification sheets assume some prior biological training. General notes on some morphological components used for identifying species within a taxon are provided where necessary. Each sheet contains the following information:

* Naylor, J.R.; Webber, W.R.; Booth, J.D. (2004). A guide to offshore crabs found in New Zealand waters. Report compiled for the Ministry of Fisheries Observer Programme. 30 p. (Unpublished report held by Ministry of Fisheries, Wellington.)

- Standard taxonomic hierarchy of the organism
- Scientific and common name
- 3-letter Ministry of Fisheries code
- Illustration (line drawing or photograph)
- Distinguishing features
- Colour
- Size
- Distribution
- Depth
- Similar species
- References

INSTRUCTIONS FOR COLLECTION AT SEA

The intention of the guide is to assist you in the identification of the common deepsea benthic fauna in the New Zealand region. If you are not confident that you can identify the organism to species, genus, or family level, then we encourage the use of the generic codes provided in the pictorial guide (pages 9–18), and ask that you retain the specimen (if possible) for identification ashore.

Specimens are required to be collected only when they:

- cannot be identified confidently
- are caught in an unusual depth or region
- are specifically requested for research purposes.

If samples or subsamples are retained, the following instructions should be followed.

Handling instructions: observers

Place the benthic sample or representative subsample of the organism in a plastic bag, separating the groups/species (particularly the sponges). Write the **trip number** and **station number** on a label, in pencil, and put inside the bag. Freeze immediately.

If the organism is fragile (e.g., a crab or prawn), place in a container of seawater and freeze. Dead shells are **not** to be recorded on catch forms, but dead shell specimens can be retained for taxonomists.

Send by frozen freight to: Collections Manager, NIWA, 301 Evans Bay Pde, Greta Pt, Kilbirnie, Wellington.

Handling instructions: researchers

Freeze benthic organisms (as above), or, if chemicals are available, carry out instructions for the relevant phyla as described below. Use plastic containers large enough to avoid crowding the specimen, at least 5:1. If large numbers of an organism are requested, freeze in bulk.

Different preservation methods are used for different purposes, e.g., DNA samples require fixing in ethanol. For taxonomic work use 5–10% buffered formalin (10% formalin = 4% formaldehyde), or 95% ethanol.

- **Cnidaria**
Hydroids, corals – preserve in 95% ethanol
Anemones – fix in 10% buffered formalin
- **Annelida**
Bristle worms, sea worms – fix in 4% buffered formalin
- **Mollusca**
Chitons, bivalves, octopus, sea slugs, snails – preserve in 95% ethanol
- **Arthropoda**
Prawns, lobsters, barnacles, isopods, amphipods, sea spiders – preserve in 95% ethanol
- **Echinodermata**
Sea-stars, brittle stars, sea urchins, sea cucumbers, feather stars, sea lilies – preserve in 95% ethanol
- **Tunicata**
sea squirts – relax in seawater with menthol crystals, then fix in 4% formalin

Pictorial guide and general description of benthic phyla



PHYLUM Porifera

COMMON NAME Sponges (ONG)

CLASS Three classes

Sessile (attached) growth forms spongy or stony to the touch, some with obvious glass splinter-like spicules. Can be encrusting, tubular, trumpet- or fan-shaped, massive mounds, spherical, stalked, or branching, ranging in size from tiny (5–10 cm) to huge (several meters long). Many are like fibreglass strands. The sponge body has no obvious animal features and is often mistaken for a plant. The body is typically composed of a skeleton of siliceous (occasionally calcareous) spicules (glass-like fragments) that may be embedded in hard collagen (spongin) fibres, around which sits the cellular material responsible for feeding (they are filter feeders).

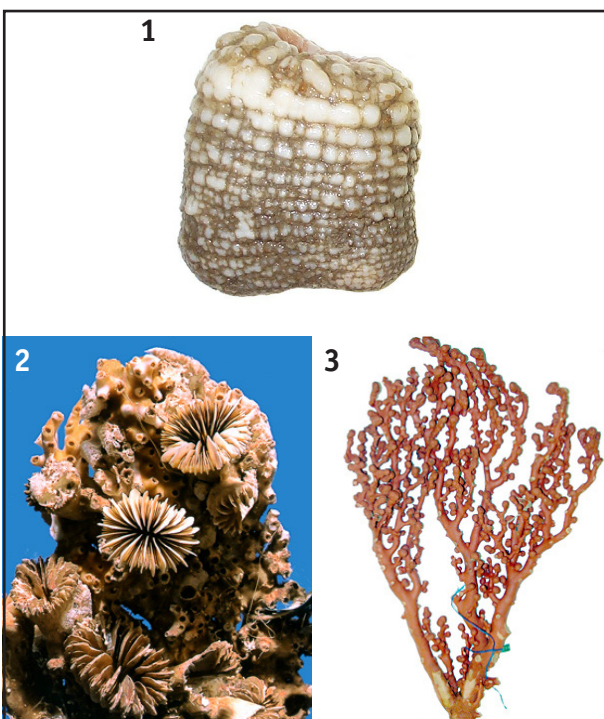


PHYLUM Cnidaria

COMMON NAME Hydroids (HDR)

CLASS Hydrozoa

Small to moderate sized coral-like forms, mostly colonial and generally attached, consisting of runners (on shells and rocks) with erect single or branching stems bearing tiny polyps. Some calcified hydroids (hydrocorals of the family Stylasteridae), with microscopic polyps (right hand photo) resemble stony corals.



COMMON NAME Corals (COU),
anemones (ANT)

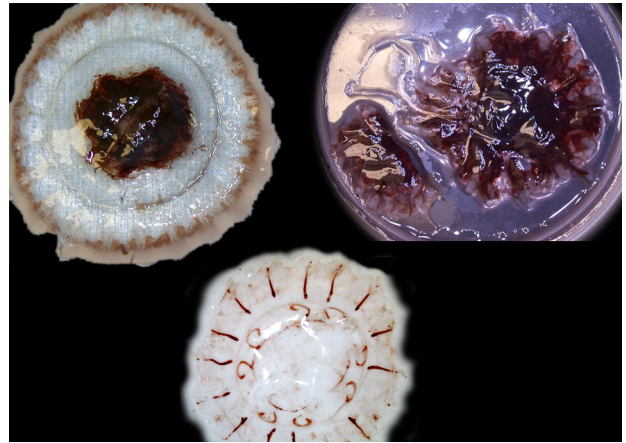
CLASS Anthozoa

Anemones are large solitary polyps, much larger than those of hydroids, and are almost always attached (1). Corals are a very diverse group. Stony corals (2) (STI) have a calcareous skeleton that has radii; there are solitary and colonial species. Octocorals have polyps with 8 pinnate (feathery) tentacles. Species are encrusting (stoloniferous), soft (SOC) and mounded (e.g., deadman's fingers), quill-like and embedded in sand or mud as a feathery stem (sea pens (PTU)), or erect and branching and very hard (gorgonians (GOC)) (3).

COMMON NAME Jellyfish (JFI)

CLASS Scyphozoa

Large medusa forms with a jelly-like disc (umbrella) and the mouth and tentacles underneath; the vast majority are free-swimming.



PHYLUM Annelida

COMMON NAME Bristle worms, sea worms (POL)

CLASS Polychaeta

The body is segmented and each segment bears a pair of paddle-like appendages bearing bristles, hence polychaeta (many bristles). At the head end there may be tiny eyes, sensory antennae, and tentacles that can be short and stubby or very long or fanlike. These worms may be burrowers, tube-dwellers, or free-living.



PHYLUM Mollusca

COMMON NAME Snails, sea slugs (GAS)

CLASS Gastropoda

Soft-bodied creatures with a well developed head, a shell of one piece (often coiled), and a broad, flat, creeping sole or foot. The shell may be completely lacking in sea slugs or small and concealed within the body.

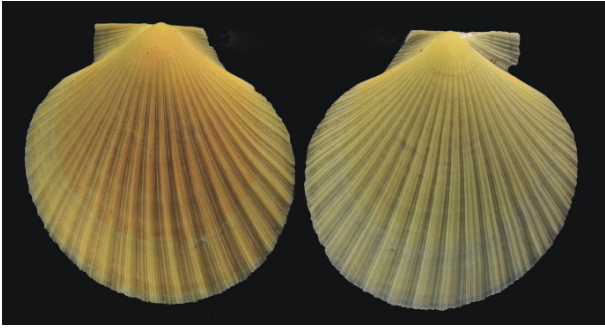


COMMON NAME Chitons (CHT)

CLASS Polyplacophora

Bilaterally symmetrical with an ovoid body with no eyes or tentacles on the tiny head. The most characteristic feature is the shell divided into 8 overlapping plates.





COMMON NAME Mussels, clams, oysters (BIV)

CLASS Bivalvia

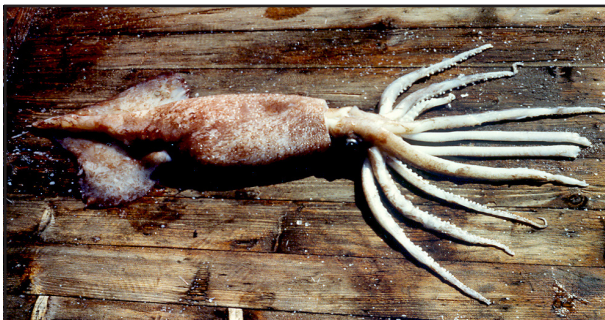
Laterally compressed with two shells, hinged dorsally, that completely encloses the body in most species. Several are mussel or - scallop - like in shape. Burrowing bivalve species have a tongue-like foot and long muscular suction tubes or siphons.



COMMON NAME Tusk shells (SPH)

CLASS Scaphopoda

Deepwater molluscs with a distinctive tapering shell with holes at each end. The shell is cylindrical and shaped like an elephant's tusk. Some species can grow up to 60 mm in length.



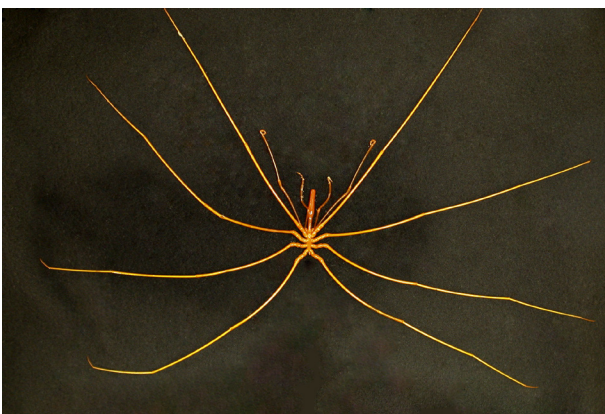
COMMON NAME Octopus (OCP), squid (SQX)

CLASS Cephalopoda

Squids (top) have an elongate, torpedo-like body with posterior fins, 8 arms, not connected at bases with a web, with 2 (occasionally more) rows of stalked suckers with rings and/or hooks running the entire length. Two longer tentacles with 2 or more rows of suckers and/or hooks occur at the distal end.



Octopuses (bottom) have a short globular sac-like body, 8 arms (no tentacles) with bases connected by a membrane-like web and unstalked suckers along the length of the arms. The head projects into a circle or crown of large prehensile tentacles or arms.



PHYLUM Arthropoda

COMMON NAME Sea spiders (PYC)

CLASS Pycnogonida

Resemble spiders. The body is much reduced and the animal appears to be almost all legs; these are long and narrow, and number 8–12. The head has an obvious proboscis with adjacent appendages, a pair of which carry egg balls in males.

COMMON NAME Krill (EUP)

CLASS Crustacea

ORDER Euphausiacea

Shrimp-like animals ca. 3 cm long. The carapace extends behind the head and forward as a rostrum, below which is a pair of stalked compound eyes. Unlike shrimps, the sides of the carapace do not tightly enclose the gills.



COMMON NAME Sea slaters (ISO)

CLASS Crustacea

ORDER Isopoda

Dorso-ventrally flattened body with a shield shaped head and no carapace. Most legs appear similar. Many parasitic forms (e.g., fish lice). Small to 2–5 cm long (a few species are much larger).

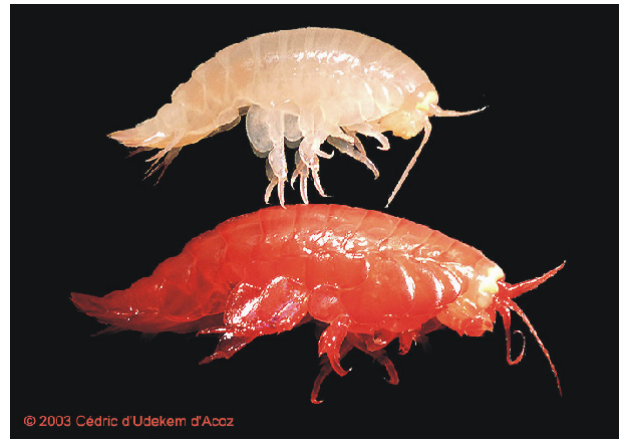


COMMON NAME Sand hoppers (APH)

CLASS Crustacea

ORDER Amphipoda

Laterally compressed (compared with isopods) and often relatively long antennae, giving a shrimp-like appearance, but there is no carapace. Generally 1 cm long or less (a few species are larger).



COMMON NAME Shrimps, prawns (NAT)

CLASS Crustacea

ORDER Decapoda

Carapace well developed, often with a forward-pointing rostrum. Five pairs of legs, of which any of the first 3 pairs may be large and chelate (clawed). There is no zoological division between shrimps and prawns — prawns are simply large shrimps. Shrimps and prawns are natants, meaning they are able to swim and are often called natant decapods.





COMMON NAME Deep-sea blind lobsters (PLY)

CLASS Crustacea

ORDER Decapoda

All or first four pairs of legs with pincers — long and slender on the first pair and small and short on the rest. Elongate, flat-topped cephalothorax, bordered with sharp spines. Rostrum small, often of two spines. Eyes represented by pigment-free points at the front.



COMMON NAME Rock (spiny) lobsters (CRU)

CLASS Crustacea

ORDER Decapoda

Rostrum small. Frontal horns over eyes. Large spiny antennae and spiny carapace. Only pincers are on females — small and on last pair of legs.



COMMON NAME Slipper (shovel-nosed) lobsters (SLL)

CLASS Crustacea

ORDER Decapoda

Rostrum very reduced. Second antennae modified to a hinged series of five flat plates. Only pincers are on females — small and on last pair of legs. Carapace flattened and often with strong spines on margins.



COMMON NAME Clawed lobsters, scampi (SCI)

CLASS Crustacea

ORDER Decapoda

Cylindrical carapace with well developed rostrum. First 3 pair of legs clawed; first pair in the form of heavy chelipeds.

COMMON NAME Crabs
(true crabs) (CRB)

CLASS Crustacea

Abdomen reduced and tightly flexed beneath thorax. First legs in form of heavy chelipeds (having large claws); third legs never chelate. Eyes on the outside of second antennae.



COMMON NAME Crabs
(lithodid crabs) (KIC)

CLASS Crustacea

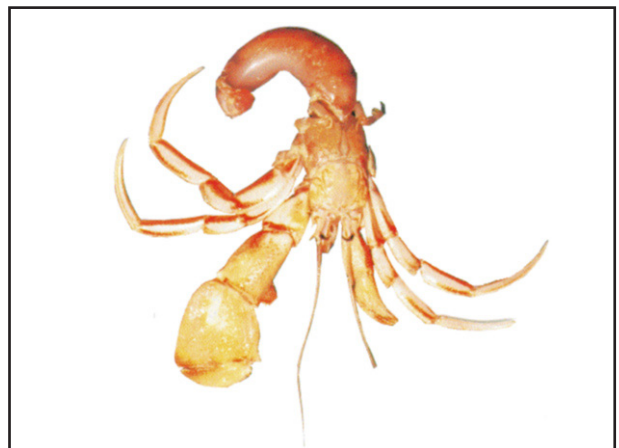
Abdomen asymmetrical (in females only) and flexed under thorax. First legs in the form of heavy chelipeds; third legs never chelate. Appearing to have only four pairs of legs because the fifth legs are much reduced and turned upward. Eyes between antennae.



COMMON NAME Crabs
(hermit crabs) (PAG)

CLASS Crustacea

Abdomen asymmetrical and housed within a gastropod shell or anemone or folded beneath the carapace. First legs in the form of chelipeds.



COMMON NAME Barnacles (BRN)

CLASS Crustacea

There are stalked (goose barnacle) and non-stalked (acorn barnacle) types. The mantle surface of any barnacle bears at least 5 basic plates, which are pulled together for protection.

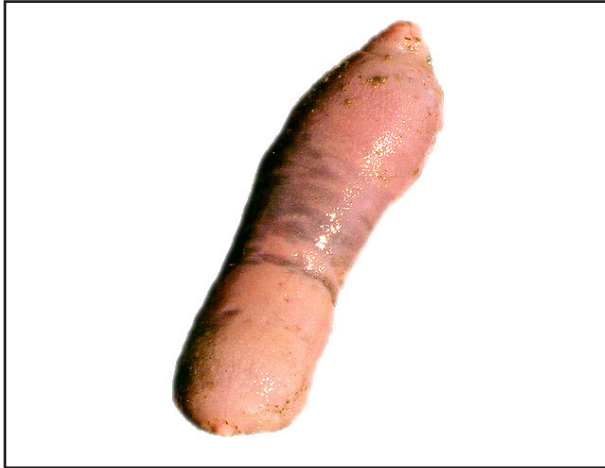




PHYLUM Sipuncula

COMMON NAME Peanut worms (SIP)

Unsegmented and rigid wormlike body divided into a narrow anterior section containing the mouth surrounded by a fringe of tentacles and a large posterior trunk. The gut is U-shaped, so the anus is not terminal (posterior) but opens as a tiny pore in the anterior part of the body.



PHYLUM Echiura

COMMON NAME Spoon worms (EHI)

Unsegmented and soft wormlike body, sausage-shaped, with a scoop-like process at the head end; the scoop (proboscis) may be rather flattened. It cannot be retracted into the trunk. The anus is at the posterior end of the body.



PHYLUM Priapulida

COMMON NAME Penis worms (PDL)

Wormlike, with a retractable proboscis and long trunk region. The proboscis is somewhat barrel shaped and ornamented with riblike papillae and minute thorn-like spines. The trunk is covered with small spines or tubercles and externally (not internally) segmented.



PHYLUM Bryozoa

COMMON NAME Moss animals, sea mats, lace corals (COZ)

This is a very diverse group, forming colonies of tiny box- or tube-like individuals called zooids. Colonies may be a few centimeters in height or diameter, being erect and bushy or flat and encrusting, sometimes large and lacy or coral-like. Individual zooids rarely more than 1 mm long.

PHYLUM Brachiopoda

COMMON NAME Lamp shells (BPD)

Resemble bivalve molluscs, but the valves enclose the body dorsally and ventrally rather than laterally, and the ventral valve is typically larger than the dorsal. Each valve is bilaterally symmetrical and may be ornamented with concentric growth lines and a fluted or spiny surface. Attached species have a short stalk emerging from the hinge area of the valves.



PHYLUM Echinodermata

COMMON NAME Sea stars (ASR)

CLASS Asteroidea

Star-shaped, free-moving echinoderms in which the body is composed of rays or arms projecting from a central area. The width of the arm usually increases towards the base, grading into the disc (in contrast to ophiuroids). Have at least 5 and often many more arms; in some species these may be so short that the body appears pentagonal.



COMMON NAME Brittle stars, basket stars (OPH)

CLASS Ophiuroidea

Extremely long, slender arms that are sharply offset from the central disc. The arms have a more solid construction than the asteroids and are much branched in basket stars.

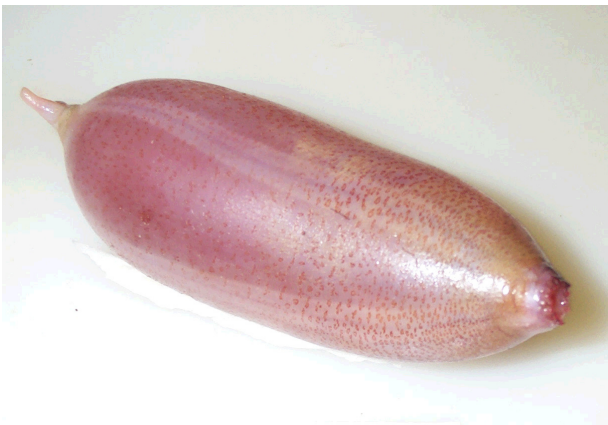




COMMON NAME Sea urchins (ECN)

CLASS Echinoidea

Body covered with spines and does not possess arms. Circular or oval when seen from above; the body is typically spherical. Irregular echinoids, such as the sand dollars and heart urchins, have much smaller and far more numerous spines and are flattened.



COMMON NAME Sea cucumbers (HTH)

CLASS Holothuroidea

Body cylindrical, with an elongated cucumber shape and a circle of tentacles around the mouth. There is no obvious skeleton (as in sea urchins), the skeletal elements being microscopic and embedded in the skin, but a few species have these in dense numbers and can be very firm.



COMMON NAME Feather stars and sea lilies (CRN)

CLASS Crinoidea

Free-living or attached by a stalk with root-like processes to the substratum. Arms are pinnately branched (feather-like). In contrast to other echinoderms, the oral surface faces upwards.

PHYLUM Tunicata

COMMON NAME Tunicates, sea squirts (ASC)

CLASS Ascidiacea

Attached, colonial or solitary. One end is attached to the substratum and the opposite end contains two openings that may be extended as separate siphons. Body feels gelatinous or leathery and has a basket shape. Colonial forms can resemble sponges (or even encrusting bryozoans), but tunicate individuals can be recognised by their small siphonal openings.



COMMON NAME Salps (SAL)

CLASS Thaliacea

Salps may be solitary or colonial, are gelatinous, transparent, free-swimming and planktonic. Siphons are at opposite ends of body (cf. ascidians).

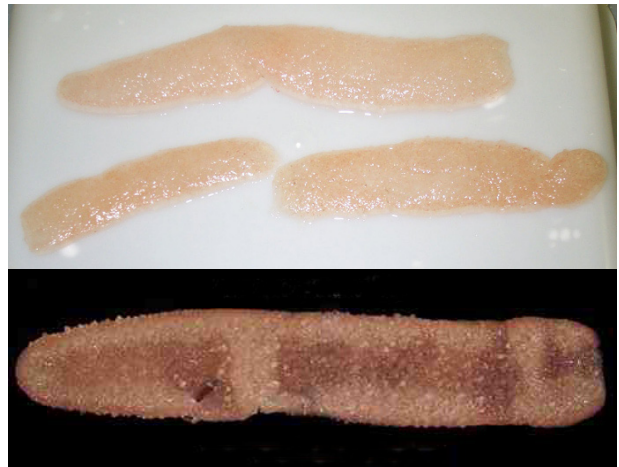


Table 1: Summary of the 106 taxa included in this guide. Phyla are arranged in conventional phylogenetic order and then within phyla, the table is sorted alphabetically by class/order, then family, then species name. s, species; g, genus; f, family; f+, several families; c, class; o, order.

Phylum	Class or Order	Family	Common name	Scientific name	MFish code	Page
Porifera (sponges)	Demospongiae (c)	Callyspongiidae	Airy finger sponge (s)	<i>Callyspongia</i> cf. <i>ramosa</i>	CRM	25
	Demospongiae (c)	Crellidae	Orange frond sponge (s)	<i>Crella incrustans</i>	CIC	26
	Demospongiae (c)	Geodiidae	Ostrich egg sponge (s)	<i>Geodinella vestigifera</i>	GVE	27
	Demospongiae (c)	Irciniidae	Rubber sponge (s)	<i>Psammocinia</i> cf. <i>hawere</i>	PHW	28
	Demospongiae (c)	Pachastrellidae	Fibreglass cup sponge (s)	<i>Poecillastra laminaris</i>	PLN	29
	Demospongiae (c)	Scleritodermiidae	Maroon pimpled ear sponge (s)	<i>Aciculites pulchra</i>	APU	30
	Hexactinellida (c)	Euretidae	Lacey honeycomb sponge (s)	<i>Eurete</i> cf. <i>simplissima</i>	ESI	31
	Hexactinellida (c)	Rossellidae	Floppy trumpet sponge (s)	<i>Acanthascus (Rhabdocalyptus) sp.</i>	GLS	32
Cnidaria (anemones, corals, hydroids)	Actiniaria (o)	Actiniidae	Deepsea anemones (g)	<i>Bolocera</i> spp.	BOC	39
	Actiniaria (o)	Actinostolidae	Smooth deepsea anemones (f+)		ACS	40
	Actiniaria (o)	Hormathiidae	Warty deepsea anemones (s)		HMT	41
	Actiniaria (o)	Liponematidae	Deepsea anemones (f+)	<i>Liponema</i> spp.	LIP	42
	Alcyonacea (o)	Clavulariidae	Long polyp soft corals (g)	<i>Telesto</i> spp.	TLO	43
	Antipatharia (o)		Black corals (o)		COB	44
	Gorgonacea (o)	Corallidae	Precious corals (g)	<i>Corallium</i> spp.	CLL	45
	Gorgonacea (o)	Paragorgiidae	Bubblegum coral (s)	<i>Paragorgia arborea</i>	PAB	46
	Gorgonacea/Calcaxonia (o)	Chrysogorgiidae	Golden corals (f)	<i>Chrysogorgia</i> spp.	CHR	47
	Gorgonacea/Calcaxonia (o)	Isididae	Bamboo corals (f)		ISI	48
	Hydroida (o)	Stylasteridae	Red hydrocorals (g)	<i>Errina</i> spp.	ERR	49
	Hydroida (o)	Stylasteridae	Spiny white hydrocorals (g)	<i>Lepidotheca</i> spp.	LPT	50
	Scleractinia (o)	Caryophyllidae	Crested cup coral (s)	<i>Desmophyllum dianthus</i>	DDI	51
	Scleractinia (o)	Caryophyllidae	Bushy hard coral (s)	<i>Goniocorella dumosa</i>	GDU	52
	Scleractinia (o)	Caryophyllidae	Deepwater branching coral (f+)	<i>Solenosmilia variabilis</i>	SVA	53
	Scleractinia (o)	Dendrophylliidae	Deepwater branching coral (f+)	<i>Enallopsammia rostrata</i>	ERO	54
	Scleractinia (o)	Flabellidae	Flabellum cup corals (g)	<i>Flabellum</i> spp.	COF	55
	Scleractinia (o)	Oculinidae	Deepwater branching coral (f+)	<i>Oculina virgosa</i>	OVI	56
Scleractinia (o)	Oculinidae	Madrepore coral (s)	<i>Madrepore oculata</i>	MOC	57	
Annelida (sea worms)	Eunicida (o)	Eunicidae	Eunice sea-worm (g)	<i>Eunice</i> (undescribed)	EUN	61
	Eunicida (o)	Onuphidae	Quill worm (g)	<i>Hyalinoecia tubicola</i>	HTU	62
	Phyllodocida (o)	Polynoidae	Thermiphione scaleworm (g)	<i>Thermiphione</i> (undescribed)	THE	63
Mollusca (snails, sea slugs, chitons, bivalves, octopus)	Amphineura (c)		Chiton (c)		CHT	64
	Bivalvia (c)	Euciroidae	Bivalve (c)	<i>Euciroa galatheae</i>	EGA	65
	Bivalvia (c)	Limidae	Giant file shell (s)	<i>Acesta maui</i>	AMA	66
	Bivalvia (c)	Pectinidae	Bivalve (c)	<i>Zygochlamys delicatula</i>	ZDE	67
	Cephalopoda (c)	Bathypolypodinae	Deepwater octopus (f+)	<i>Benthoctopus teggimathae</i>	BTE	68
	Cephalopoda (c)	Octopodidae	Yellow octopus (s)	<i>Enteroctopus zealandicus</i>	EZE	69
	Cephalopoda (c)	Octopodidae	Deepwater octopus (f+)	<i>Graneledone</i> spp.	DWO	70
	Cephalopoda (c)	Octopodidae	Common octopus (f+)	<i>Pinnoctopus cordiformis</i>	OCT	71
	Cephalopoda (c)	Opisthoteuthidae	Umbrella octopus (g)	<i>Opisthoteuthis</i> spp.	OPI	72
	Gastropoda (c)	Buccinidae	Gastropod (c)	<i>Aeneator recens</i>	AER	73
	Gastropoda (c)	Buccinidae	Gastropod (c)	<i>Austrofusus glans</i>	KWH	74
	Gastropoda (c)	Calliostomatidae	Gastropod (c)	<i>Calliostoma turnerarum</i>	CTN	75
Gastropoda (c)	Nudibranchia (o)	Sea slug, nudibranch (o)	Generic nudibranch	NUD	76	

Phylum	Class/Order	Family	Common name	Scientific name	MFish code	Page
Mollusca (snails, sea slugs, chitons, bivalves, octopus)	Gastropoda (c)	Ranellidae	Gastropod (c)	<i>Fusitriton magellanicus</i>	FMA	77
	Gastropoda (c)	Turbinellidae.	Gastropod (c)	<i>Coluzea mariae</i>	CMR	78
	Gastropoda (c)	Volutidae	Volute (f)	<i>Alcithoe larochei</i>	ALL	79
	Gastropoda (c)	Volutidae	Golden volute (s)	<i>Provocator mirabilis</i>	GVO	80
Arthropoda (sea spiders, isopods, amphipods, prawns, lobsters, hermit crabs, barnacles)	Amphipoda (o)	Lysianassidae	Amphipod (o)	<i>Eurythenes gryllus</i>	EUG	89
	Anomura (o)	Paguridae	Hermit crab (f+)	<i>Diacanthurus rubricatus</i>	DIR	90
	Anomura (o)	Parapaguridae	Hermit crab (f+)	<i>Sympagurus dimorphus</i>	SDM	91
	Decapoda (o)	Aristeidae	Royal red prawn (s)	<i>Aristaeomorpha foliacea</i>	AFO	92
	Decapoda (o)	Aristeidae	Scarlet prawn (s)	<i>Aristaeopsis edwardsiana</i>	PED	93
	Decapoda (o)	Campylonotidae	Sabre prawn (s)	<i>Campylonotus rathbunae</i>	CAM	94
	Decapoda (o)	Glyphocrangonidae	Goblin prawn (s)	<i>Glyphocrangon lowryi</i>	GLO	95
	Decapoda (o)	Nematocarcinidae	Omega prawn (s)	<i>Lipkius holthuisi</i>	LHO	96
	Decapoda (o)	Nematocarcinidae	Spider prawns (g)	<i>Nematocarcinus</i> spp.	NEC	97
	Decapoda (o)	Nephropidae	Scampi (s)	<i>Metanephrops challengeri</i>	SCI	98
	Decapoda (o)	Oplophoridae	Subantarctic ruby prawn (g)	<i>AcanthePHYra</i> spp.	ACA	99
	Decapoda (o)	Oplophoridae	Deepwater prawns (f+)	<i>Oplophorus</i> spp.	ONO	100
	Decapoda (o)	Palinuridae	Deepwater rock lobster (s)	<i>Projasus parkeri</i>	PPA	101
	Decapoda (o)	Pandalidae	Golden prawn (s)	<i>Plesionika martia</i>	PLM	102
	Decapoda (o)	Pasiphaeidae	Deepwater prawn (f+)	<i>Pasiphaea</i> aff. <i>tarda</i>	PBA	103
	Decapoda (o)	Polychelidae	Deepsea blind lobster (s)	<i>Polycheles suhmi</i>	PSU	104
	Decapoda (o)	Scyllaridae	Prawn killer (s)	<i>Ibacus alticrenatus</i>	PRK	105
	Decapoda (o)	Solenoceridae	Jack-knife prawn (s)	<i>Haliporoides sibogae</i>	HSI	106
	Isopoda (o)	Aegidae	Fish biter (s)	<i>Aega monophthalma</i>	AMO	107
	Isopoda (o)	Serolidae	Spiny serolid isopod (s)	<i>Acutiserolis</i> sp.	ACU	108
	Lophogastrida (o)	Gnathophausiidae	Giant red mysid (s)	<i>Neognathophausia ingens</i>	GNA	109
Pantopoda (o)	Colossendeidae	Giant sea spiders (s)	<i>Colossendeis</i> spp.	PYC	110	
Reptantia (o)	Galatheidae	Krill, squat lobsters (f)	<i>Munida</i> spp.	MNI	111	
Reptantia (o)	Galatheidae	Squat lobsters (f)	<i>Uroptychus</i> spp.	URP	112	
Thoracica (o)	Scalpellidae	Acorn barnacle (s)	<i>Smilium zancleanum</i>	BRN	113	
Echinodermata (sea stars, brittle stars, sea urchins, sea cucumbers, feather stars and sea lilies)	Asteroidea (c)	Asteriidae	Cat's-foot star (s)	<i>Cosmasterias dyscrita</i>	CDY	119
	Asteroidea (c)	Asteriidae	Cross-fish (s)	<i>Sclerasterias mollis</i>	SMO	120
	Asteroidea (c)	Astropectinidae	Magnificent sea-star (s)	<i>Dipsacaster magnificus</i>	DMG	121
	Asteroidea (c)	Astropectinidae	Abyssal star (s)	<i>Plutonaster knoxi</i>	PLT	122
	Asteroidea (c)	Astropectinidae	Geometric star (s)	<i>Psilaster acuminatus</i>	PSI	123
	Asteroidea (c)	Benthopectinidae	Five-spined star (s)	<i>Benthopecten pikei</i>	BPI	124
	Asteroidea (c)	Brisingidae etc	Armless stars (s)		BRG	125
	Asteroidea (c)	Goniasteridae	Pentagon star (s)	<i>Ceramaster patagonicus patagonicus</i>	CPA	126
	Asteroidea (c)	Goniasteridae	Trojan star (s)	<i>Hippasteria phrygiana</i>	HTR	127
	Asteroidea (c)	Goniasteridae	Rock star (s)	<i>Lithosoma novaezelandiae</i>	LNV	128
	Asteroidea (c)	Goniasteridae	Sladen's star (s)	<i>Mediaster sladeni</i>	MSL	129
	Asteroidea (c)	Odontasteridae	Pentagonal tooth-star (s)	<i>Odontaster benhami</i>	ODT	130
	Asteroidea (c)	Solasteridae	Sun-star (f)	<i>Crossaster multispinus</i>	CJA	131
	Asteroidea (c)	Solasteridae	Chubby sun-star (s)	<i>Solaster torulatus</i>	SOT	132
	Asteroidea (c)	Zoroasteridae	Rat-tail stars (s)	<i>Zoroaster</i> spp.	ZOR	133
	Crinoidea (c)	Comatulida (o)	Feather stars (o)		CMT	134
	Crinoidea (c)	Isocrinida (o)	Sea lilies with cirri (o)		CRN	135
	Crinoidea (c)	Millericrinida, Cyrtocrinida (o)	Sea lilies without cirri (o+)		CRN	136

Phylum	Class or Order	Family	Common name	Scientific name	MFish code	Page
Echinodermata (sea stars, brittle stars, sea urchins, sea cucumbers, feather stars and sea lilies)	Echinoidea (c)	Cidaridae	Parasol urchin (s)	<i>Goniocidaris parasol</i>	GPA	137
	Echinoidea (c)	Cidaridae	Umbrella urchin (s)	<i>Goniocidaris umbraculum</i>	GOU	138
	Echinoidea (c)	Echinidae	Deepsea urchin (s)	<i>Dermechinus horridus</i>	DHO	139
	Echinoidea (c)	Echinidae	Deepsea kina (s)	<i>Gracilechinus multidentatus</i>	GRM	140
	Echinoidea (c)		Tam O'Shanters (f+)		TAM	141
	Echinoidea (c)	Pedinidae	Banded-spine urchin (s)	<i>Caenopedina novaezelandiae</i>	CNO	142
	Echinoidea (c)	Spatangidae	Microsoft mouse (s)	<i>Paramaretia peloria</i>	PMU	143
	Echinoidea (c)	Spatangidae	Matheson's heart urchin (s)	<i>Spatangus mathesoni</i>	SMT	144
	Echinoidea (c)	Spatangidae	Purple-heart urchin (s)	<i>Spatangus multispinus</i>	SPT	145
	Echinoidea (c)	Temnopleuridae	Fleming's urchin (s)	<i>Pseudechinus flemingi</i>	PFL	146
	Holothuroidea (c)		Sea cucumbers (c)		HTH	147
	Ophiuroidea (c)	Gorgonocephalidae	Waite's snake-star (s)	<i>Astrothorax waitei</i>	AWA	148
	Ophiuroidea (c)	Gorgonocephalidae	Gorgons head basket-stars (g)	<i>Gorgonocephalus</i> spp.	GOR	149
Ophiuroidea (c)	Ophiodermatidae	Deepsea brittle star (s)	<i>Bathypectinura heros</i>	BHE	150	
Tunicata (sea squirts and salps)	Ascidacea (c)	Styelidae	Sea squirts (c)	<i>Cnemidocarpa bicornuta</i>	ASC	153
	Thaliacea (c)	Salpidae	Salps (c)	<i>Pyrosoma atlanticum</i>	PYR	154

PHYLUM

Porifera

Sponges

Phylum Porifera
Class Demospongiae (siliceous sponges)
Order Haplosclerida (air sponges)
Family Callyspongiidae

***Callyspongia cf. ramosa* (Airy finger sponge) (CRM)**



Distinguishing features: Flattened fingers of thick, golden fibres; looks dead (not fleshy); elastic and flexible when wet; airy, compressible.

Colour: Golden yellow-brown.

Size: Diameter from 5 to 30 cm.

Distribution: New Zealand region.

Depth: 300 to 600 m.

Similar species: None.

References: Bergquist, P.R.; Warne, K.P. (1980). The marine fauna of New Zealand: Porifera, Demospongiae, Part 3 (Haplosclerida and Nepheliospongida). *New Zealand Oceanographic Institute Memoir 87*. 77 p.

Phylum Porifera
Class Demospongiae (siliceous sponges)
Order Poecilosclerida (bright sponges)
Family Crellidae

***Crella incrustans* (Orange frond sponge) (CIC)**



Distinguishing features: Mass of flattened fronds or finger-like branches; rubbery, fibrous, flexible; slightly translucent.

Colour: Bright orange.

Size: Diameter from 5 to 30 cm.

Distribution: New Zealand region.

Depth: 300 to 600 m.

Similar species: None.

References: Bergquist, P.R.; Fromont, P.J. (1988). The marine fauna of New Zealand: Porifera, Demospongiae, Part 4 (Poecilosclerida). *New Zealand Oceanographic Institute Memoir* 96. 197 p.

Phylum Porifera
Class Demospongiae (siliceous sponges)
Order Astrophorida (sandpaper sponges)
Family Geodiidae

***Geodinella vestigifera* (Ostrich egg sponge) (GVE)**



Distinguishing features: Convoluted mass with hard outer shell and softer inside; groups of exhalant pores on surface; sometimes like a tuber.

Colour: Tan with mottled patches of pink or brown.

Size: Diameter from 2 to 50 cm.

Distribution: Northeastern New Zealand seamounts, Chatham Rise.

Depth: 10 to 1090 m.

Similar species: None.

References: Dendy, A. (1924). Porifera. Part I. Non-antarctic sponges. Natural History Report. British Antarctic ("Terra Nova") Expedition, 1910, *Zoology* 6(3): 269–392, pls 1–15.

Phylum Porifera
Class Demospongiae (siliceous sponges)
Order Dictyoceratida (rubber sponges)
Family Irciniidae

***Psammocinia cf. hawere* (Rubber sponge) (PHW)**



Distinguishing features: Club-shaped with expanded lobes, slightly flat on top; top (illuminated) surfaces tinged with maroon; compressible; fine conules on surface.

Colour: Dark tan with maroon tinges on upper surfaces.

Size: Diameter from 5 to 30 cm.

Distribution: New Zealand region.

Depth: 300 to 600 m.

Similar species: None.

References: Cook, S. de C.; Bergquist, P.R. (1998). Revision of the genus *Psammocinia* (Porifera: Demospongiae: Dictyoceratida), with six new species from New Zealand. *New Zealand Journal of Marine and Freshwater Research* 32: 399–426.

Phylum Porifera
Class Demospongiae (siliceous sponges)
Order Astrophorida (sandpaper sponges)
Family Pachastrellidae

***Poecillastra laminaris* (Fibreglass cup sponge) (PLN)**



Distinguishing features: Ear-shaped to thick plate, crunchy, non-elastic texture, resembles fibreglass matting, very siliceous and hairy.

Colour: Cream to white, tinged with brown.

Size: Diameter from 5 to 10 cm.

Distribution: Christable Seamount, Cavalli Seamounts, Chatham Rise seamounts.

Depth: 770 to 1050 m.

Similar species: None.

References: Lévi, C.; Lévi, P. (1983). Eponges Tetractinellides et Lithistides bathyales de Nouvelle Calédonie. *Bulletin Muséum National d'Histoire Naturelle, Paris* (4)5 (A,1): 101–168.

Phylum Porifera
Class Demospongiae (siliceous sponges)
Order 'Lithistid' Demospongiae (rock sponges)
Family Scleritodermiidae

***Aciculites pulchra* (Maroon pimpled ear sponge) (APU)**



Distinguishing features: Ear-shaped plate with a curved edge as a juvenile, forming a large convoluted bowl-like structure as an adult; concave surface covered in regularly spaced "pimples"; texture stony and rigid.

Colour: Maroon on light-exposed upper surfaces; cream to tan undersides and internally.

Size: Diameter from 5 to 40 cm.

Distribution: New Caledonia, Norfolk Ridge seamounts, northeastern New Zealand seamounts.

Depth: 100 to 1100 m.

Similar species: *Corallistes fulvodesmus* Lévi and Lévi, 1983.

References: Dendy, A. (1924). Porifera. Part I. Non-antarctic sponges. Natural History Report. British Antarctic ("Terra Nova") Expedition, 1910, *Zoology* 6(3): 269–392, pls 1–15.

Phylum Porifera
Class Hexactinellida (glass sponges)
Order Hexactinosida (lace sponges)
Family Euretidae

***Eurete cf. simplissima* (Lacey honeycomb sponge) (ESI)**



Distinguishing features: Stony lace-like white tubes with elevated openings along the side of the tube; very delicate.

Colour: White to cream; dark brown if dead for a while.

Size: Diameter from 1 to 5 cm.

Distribution: Northeastern New Zealand seamounts, Kermadec Ridge, Chatham Rise, Bollons Seamount.

Depth: 770 to 1070 m.

Similar species: None.

References: Reiswig, H. M.; Wheeler, B. (2002). Family Euretidae Zittel, 1877. *In*, Hooper, J.N.A.; Soest, R.W.M. van (eds). *Systema Porifera: a guide to the classification of sponges*. New York. Kluwer Academic/Plenum Publishers, pp. 1301–1331.

Phylum Porifera
Class Hexactinellida (glass sponges)
Order Lyssacinosa (trumpet sponges)
Family Rossellidae

***Acanthascus (Rhabdocalyptus) sp.* (Floppy trumpet sponge) (GLS)**



Distinguishing features: Soft floppy collapsible trumpets; tears easily like thick, soggy paper; close-up looks like fibre glass matting.

Colour: Tan to cream.

Size: Total length from 10 to 1500 cm. Diameter 10–30 cm.

Distribution: Northeastern New Zealand seamounts, Chatham Rise, Campbell Plateau (North of Campbell Island).

Depth: 300 to 600 m.

Similar species: None.

References: Tabachnick, K. R. (2002). Family Rossellidae Schulze, 1885. *In*, Hooper, J.N.A.; Soest, R.W.M. van (eds). *Systema Porifera: a guide to the classification of sponges*. New York. Kluwer Academic/Plenum Publishers, pp. 1441–1505.

PHYLUM

Cnidaria

Anemones, corals, hydroids

Phylum

CNIDARIA

Anemones, corals, jellyfish, and hydroids

Class Anthozoa — Corals, anemones, and kin

Anthozoans are the largest group of Cnidaria, with about 6000 living species worldwide. All are marine, and there is no medusa phase. The mouth opens into a stomach cavity that is partitioned by mesenteries (membranes) that expand the inner absorptive surface. There are two subclasses: the Octocorallia (Alcyonaria), which have eight mesenteries and tentacles, and the Hexacorallia (Zoantharia) with tentacles and mesenteries in multiples of six.

Corals are distinguished from their soft-bodied relatives like sea anemones, jellyfish, and hydroids by being calcified, i.e., incorporating calcium carbonate (lime) into their bodies to create a skeleton. Several kinds of cnidarians do this, and they can superficially resemble each other if they have a similar shape. The main kinds of calcified cnidarians in New Zealand waters are hydrocorals, gorgonians (octocorals), and stony corals.

Subclass Octocorallia

This subclass used to be divided into a number of orders, all but one colonial, in which the polyps are united by cords or sheets of tissue (coenenchyme). Octocorals, so-called because polyps have an 8-fold symmetry (8 tentacles and internal body partitions), can be relatively soft (sea pens and soft corals like dead-men's fingers) or, as in gorgonians, have an erect axis of calcareous spicules or of hardened protein impregnated with lime. In bamboo corals and some other gorgonians the axis may be jointed. Octocorals also lack the distinctive vertical radial partitions that characterise stony corals.

In the New Zealand EEZ, 180 octocoral species (132 undescribed) are known, divided among 86 genera in 27 families. These include 35 species of Alcyonacea (spreading runnerlike corals and soft octocorals), 115 species of Gorgonacea (gorgonians including the bubblegum corals), and 30 species of sea pens. The diversity of three families of deepwater calcified gorgonians (Isididae – bamboo corals, Primnoidae – bottlebrush corals, and Chrysogorgiidae – golden corals) is probably the highest in the world for a single country.

The stature of large gorgonian colonies is made possible by the enhanced development of skeletal material. In holaxonians, the axis is horny or woodlike, owing to the presence of a scleroprotein called gorgonin, and may be further strengthened by impregnation of calcium carbonate, but there are no sclerites in the axis. In bamboo corals (family Isididae) the axis is conspicuously jointed, with solid calcium carbonate between the joints. In isidids as well as other calcaxonians (highly calcified gorgonians) such as Primnoidae and Chrysogorgiidae, the axes may give evidence of distinct growth rings in cross section.

Subclass Hexacorallia

Hexacorals may be solitary or colonial, soft or hard, the latter having rigid calcified skeletons. Soft hexacorals make up the orders Ceriantharia (tube anemones), Actiniaria (sea

anemones), Corallimorpharia (coral-like anemones), and Zoanthidea (zoanthid anemones). Hard hexacorals make up the orders Scleractinia (stony corals) and Antipatharia (black corals). In the stony (or true) corals, calcification extends into the mesenteries, creating rigid septa that remain in the dead coral skeletons.

Order Ceriantharia

Tube anemones are solitary tube-dwelling hexacorals living in muddy bottoms. They are not a diverse group and the sole (?) New Zealand species has not been characterised taxonomically.

Order Actiniaria (sea anemones)

New Zealand has a high diversity of soft hexacorals, especially of sea anemones (actinians). The deep-sea anemone fauna is widely distributed but poorly described. Sea anemones have 6 tentacles or multiples of 6 with nettle cells that sting and capture small or large prey. Some species are anchored in soft sediment, attached to rocks by their base, or can move slowly over the seabed. Many habitually grow on other creatures, including sponges, corals, and shells. Many species are distinguished by attributes of the nematocysts and muscles, so if there is more than one species of a genus in an area, the genus name is often the only name available.

Order Zoanthidea

Twelve species are listed for the New Zealand region. Zoanthids are anemone-like hexacorals with a colonial lifestyle. One of them is *Epizoanthus*, which settles on shells occupied by hermit crabs. As it grows it envelopes the shell. Almost nothing is known about their biology other than the association of several species with sponges, hydroids, and molluscs. A striking yellow species of *Parazoanthus* is frequently encountered on Fiordland black coral. There is also a new species of Gerardiidae from New Zealand — a family able to generate its own skeleton.

Order Antipatharia (black corals)

About 58 black coral species are known in New Zealand waters. Black corals are distinguished by their erect, often bushy, habit of growth and hard proteinaceous skeleton that bears tiny polyps. Although the depth and geographic distribution of the Antipatharia have not been analysed in detail, it appears that most species live in the deep sea and on seamounts at between 200 and 1000 metres depth. All New Zealand black coral species are strictly protected.

Order Corallimorpharia

Some seven species and subspecies are known in the New Zealand EEZ. The commonest is the colourful jewel anemone, *Corynactis australis*, found in low-tidal rock pools and shallow depths. The species looks like a spreading colonial sea anemone. Each tentacle is tipped with a characteristic white knob that is densely and minutely studded with nettle cells. Other corallimorpharian species occur in deep water.

Order Scleractinia (stony corals)

New Zealand has a diverse fauna of 127 stony coral species, 110 of which are azooxanthellate, comprising 16.4% of the 669 known azooxanthellate (i.e., lacking symbiotic algae) species. Azooxanthellates/ahermatypes are sometimes called 'deepwater corals' or 'solitary corals' and are usually small and slower growing, and do not form reefs like their zooxanthellate reef counterparts.

Stony corals are calcified hexacorals, i.e., having body parts in multiples of 6. Coral polyps may be thought of as skeleton-forming anemones. The internal membranes (mesenteries) that partition the bodies of sea anemones are calcified in corals so that,

when all soft tissues are removed, the polyp skeleton is seen to have distinctive vertical radii (*septa*), often divided into cycles of major and minor ones.

An entire coral, called a *corallum*, may consist of a single individual or a colony of many individuals. The skeleton (*corallite*) of an individual polyp has a cup-shaped opening (*calyce*) that is typically round or oval as in New Zealand's cold-water corals, but in tropical corals neighbouring corallites can be fused and conjoined, resulting in large compound calyces.

Class Scyphozoa — jellyfish

The Scyphozoa is a small group of cnidarians numbering only about 250 living species worldwide. Notwithstanding the low species diversity, this minor group has caused some major problems recently around the world and in New Zealand. Understanding of jellyfish bloom dynamics remains incomplete, but large financial losses resulting from jellyfish invasions continue to be reported.

Scyphozoans are entirely marine, with a reduced or absent polyp phase and generally a large and conspicuous medusa phase. Unlike those of hydrozoans and anthozoans, scyphozoan polyps are more or less unattached to one another and do not share nutrients with other colony members. Medusa formation is by a form of budding, called strobilation, with the polyp typically remaining to continue budding and even to strobilate again. Scyphozoans are present from the shallowest intertidal to at least benthopelagic depths. There are three orders — Coronatae, easily distinguished by the presence of a coronal groove on the outer umbrella surface; Semaestomae, typically with long, flowing oral arms and marginal tentacles; and Rhizostomeae, which lack true marginal tentacles as well as a central mouth, instead having numerous tiny mouths on the edges of the oral arms. Stalked jellyfish (upside-down jellyfish) are now regarded as a separate class (Staurozoa).

Class Hydrozoa — hydroids and their medusae

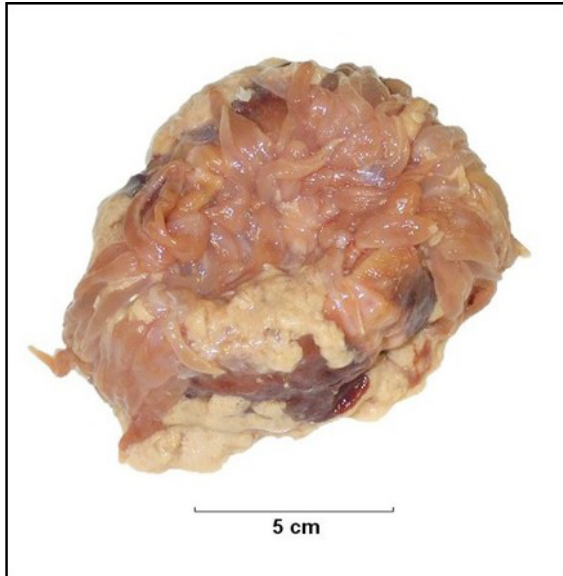
Hydrocorals (stylasterids) all belong to the hydroid family Stylasteridae. Hydroids are generally small and non-calcified, so hydrocorals are unusual in this respect. Like other hydroids, hydrocorals have tiny polyps — some of these function like stomachs (gastrozooids) while the non-feeding polyps are tentacle-like and used for food-capture (dactylozooids) or for reproducing (gonozooids). New Zealand hydrocorals are erect and branching, and may be white or red.

Their skeletons are distinguished from those of stony corals by being generally much smaller and less robust, and minutely porous and pitted with small holes for the various polyps. These holes (openings) lack the distinctive vertical radial partitions that characterise stony corals.

Hydrozoans are remarkably varied. They may be solitary or colonial, with polyp and medusa phases, or either phase may be lacking altogether.

Phylum Cnidaria
Class Anthozoa
Order Actiniaria (anemones)
Family Actiniidae

***Bolocera* spp. (Deepsea anemones) (BOC)**



Distinguishing features: A flat spherical body form with several tentacles visible around edge. Currently identified to genus level only.

Colour: Red, brown.

Size: Up to 20 cm.

Distribution: This genus is widely distributed around the world, but poorly described.

Depth: 200 to 1500 m.

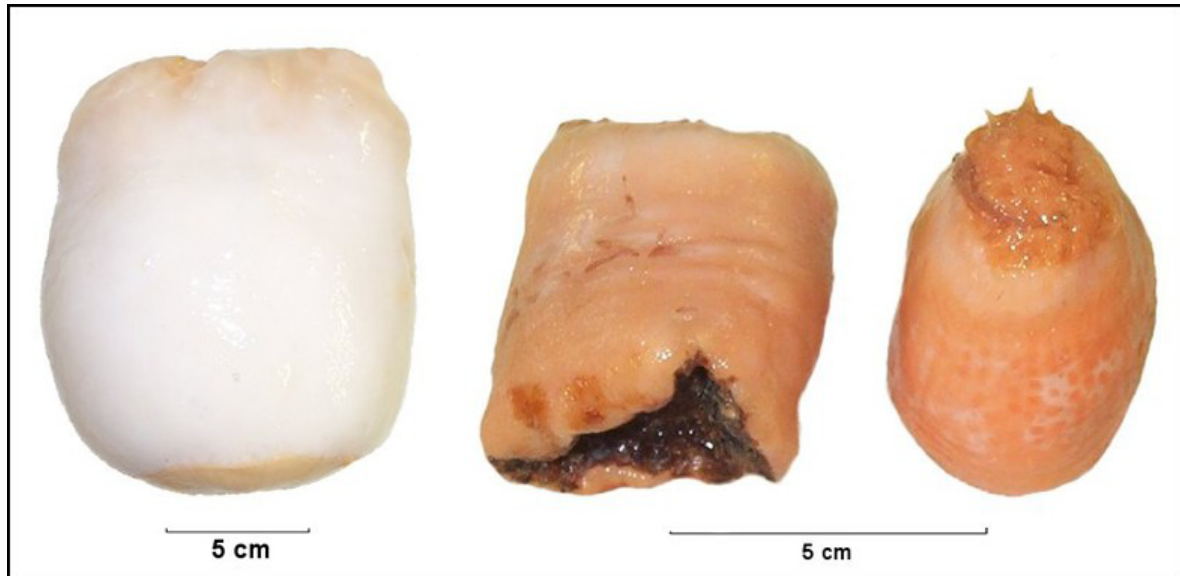
Similar species: *Liponema* spp.

References: Dunn, D. F. (1983). Some Antarctic and Sub-Antarctic sea anemones. (Coelenterata: Ptychodactiaria and Actiniaria). *Biology of the Antarctic Seas XIV Antarctic Research Series 39(1)*: 1–67.

Fautin, D. G. (1984). More Antarctic and Sub-Antarctic sea anemones. (Coelenterata: Corallimorpharia and Actiniaria). *Biology of the Antarctic Seas XVI Antarctic Research Series 41(1)*. 42 p.

Phylum Cnidaria
Class Anthozoa
Order Actiniaria (anemones)
Family Actinostolidae

(Smooth deepsea anemones) (ACS)



Distinguishing features: A smooth, cylindrical body form, with thickened walls and often with a reddish brown base. Tentacles mostly or completely hidden. Currently identified to family level only.

Colour: White, creamy white, or brown.

Size: Up to 20 cm.

Distribution: The family has worldwide distribution, but is poorly described.

Depth: 200 to 1500 m.

Similar species: Members of the Actinostolidae family (smooth deepsea anemones).

References: Dunn, D. F. (1983). Some Antarctic and Sub-Antarctic sea anemones. (Coelenterata: Ptychodactiaria and Actiniaria). *Biology of the Antarctic Seas XIV Antarctic Research Series 39(1)*. 67 p.

Fautin, D. G. (1984). More Antarctic and Subantarctic sea anemones. (Coelenterata: Corallimorpharia and Actiniaria). *Biology of the Antarctic Seas XVI Antarctic Research Series 41(1)*. 42 p.

Phylum Cnidaria
Class Anthozoa
Order Actiniaria (anemones)
Family Hormathiidae

(Warty deepsea anemones) (HMT)



Distinguishing features: An irregularly shaped body made up of longitudinal and circumferential furrows which give a warty appearance. Tentacles mostly or completely hidden. Currently identified to family level only.

Colour: White, creamy white, or brown.

Size: Up to 20 cm.

Distribution: The family has worldwide distribution, but is poorly described.

Depth: 200 to 1500 m.

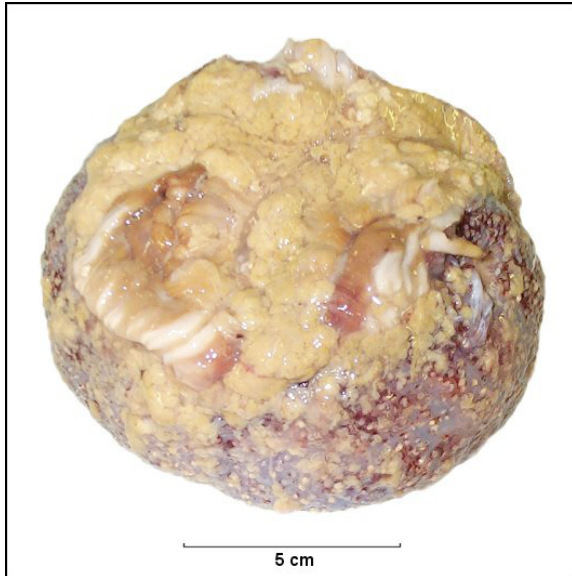
Similar species: Members of the Actinostolidae family (smooth deepsea anemones).

References: Dunn, D. F. (1983). Some Antarctic and Sub-Antarctic sea anemones. (Coelenterata: Ptychodactiaria and Actiniaria). *Biology of the Antarctic Seas XIV Antarctic Research Series 39(1)*. 67 p.

Fautin, D. G. (1984). More Antarctic and Subantarctic sea anemones. (Coelenterata: Corallimorpharia and Actiniaria). *Biology of the Antarctic Seas XVI Antarctic Research Series 41(1)*. 42 p.

Phylum Cnidaria
Class Anthozoa
Order Actiniaria (anemones)
Family Liponematidae

***Liponema* spp. (Deepsea anemones) (LIP)**



Distinguishing features: A firm, squat spherical body form. Several short, white and rust coloured radially arranged tentacles visible. Currently identified to genus level only.

Colour: Cream and rust red.

Size: Up to 20 cm.

Distribution: This genus is widely distributed around the world, but poorly described.

Depth: 200 to 1500 m.

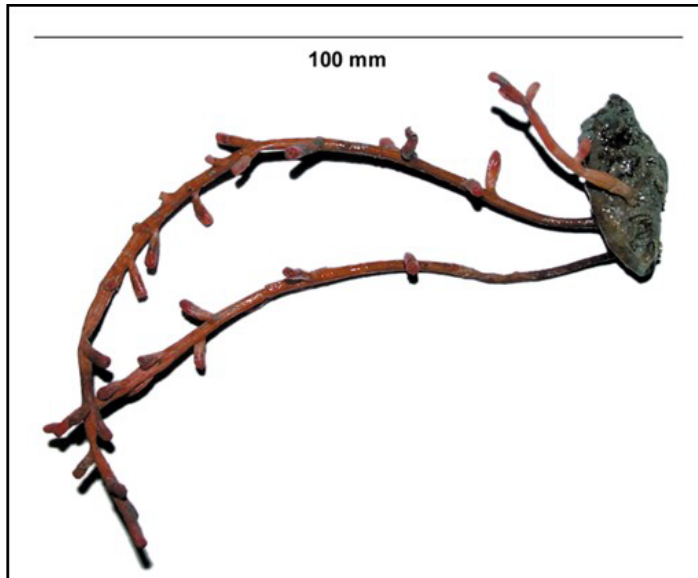
Similar species: *Bolocera* spp.

References: Dunn, D. F. (1983). Some Antarctic and Sub-Antarctic sea anemones. (Coelenterata: Ptychodactiaria and Actiniaria). *Biology of the Antarctic Seas XIV Antarctic Research Series 39(1)*. 67 p.

Fautin, D. G. (1984.) More Antarctic and Subantarctic sea anemones. (Coelenterata: Corallimorpharia and Actiniaria). *Biology of the Antarctic Seas XVI Antarctic Research Series 41(1)*. 42 p.

Phylum Cnidaria
Class Anthozoa
Order Alcyonacea (soft corals)
Family Clavulariidae

***Telesto* spp. (Long polyp soft corals) (TLO)**



Distinguishing features: Semi rigid, long axial polyps with shorter lateral polyps, occasional branching and budding giving rise to several axial polyps. Polyp wall exhibiting longitudinal branching rows.

Colour: Red, pink, or beige.

Size: Up to 20 cm.

Distribution: Worldwide.

Depth: 5 to 1000 m.

Similar species: *Coelogorgia* spp. and *Telestula* spp. Microscopic examination of sclerites is required for a reliable identification.

References: Bayer, F.M. (1981). On some genera of stoloniferous octocorals (Coelenterata: Anthozoa) with descriptions of new taxa. *Proceedings of the Biological Society of Washington* 94(3): 878–901.

Phylum Cnidaria
Class Anthozoa
Order Antipatharia (black corals)
Family

(Black corals) (COB)



Distinguishing features: Erect, often bushy, habit of growth, with a hardened protein skeleton that bears tiny polyps. The skeleton may be naturally lustrous, or rendered so after polishing.

Colour: In life, generally white owing to the external layer of "skin" and polyps although the living material in some species, can be yellow or green. The skeleton is black.

Size: Up to 5 m.

Distribution: Antipatharia are found in deep water throughout the EEZ from 200 to at least 1000 m. *Antipathella fiordensis*, previously known as *Antipathes fiordensis*, is endemic to New Zealand's fiords.

Depth: 200 to 1000 m. In New Zealand fiords found in very shallow waters (<10 m).

Similar species: There are numerous genera among the 58 species. Some gorgonians are similar, but these tend to lack the fine spines of black corals.

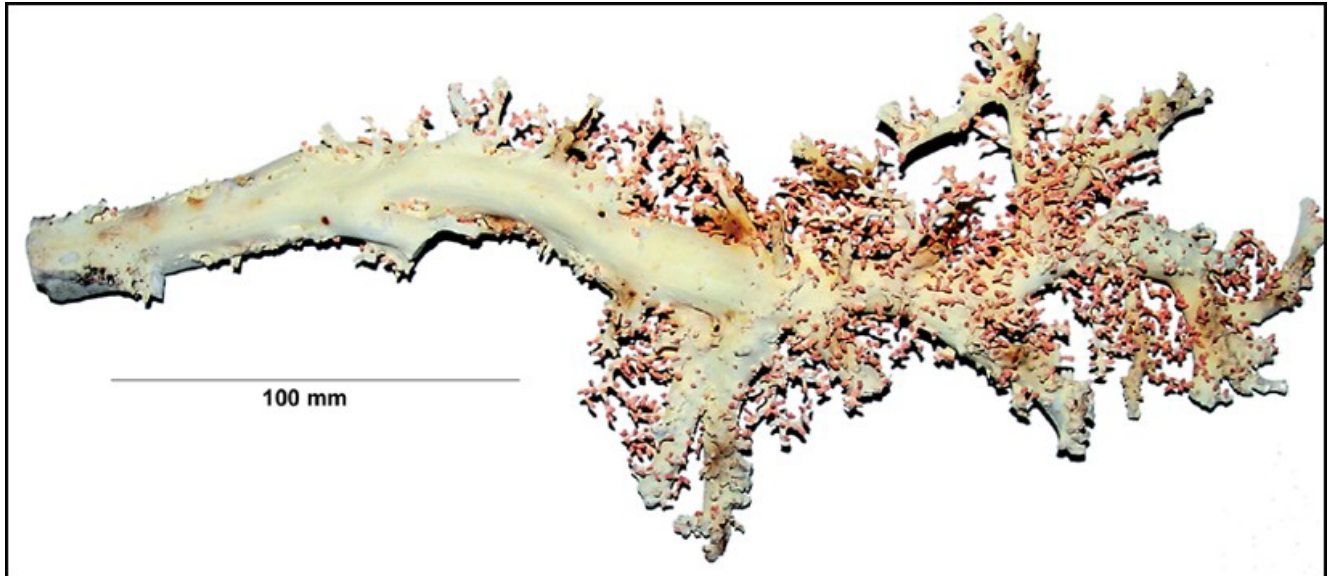
References: Grange, K.R. (1985). Distribution, standing crop, population structure, and growth rates of black coral in the southern fiords of New Zealand. *New Zealand Journal of Marine and Freshwater Research* 19: 467–475.

Grange, K.R. (1990). *Antipathes fiordensis*, a new species of black coral (Coelenterata: Antipatharia) from New Zealand. *New Zealand Journal of Zoology* 17: 279–282.

Opreško, D.M. (2001). Revision of the Antipatharia (Cnidaria: Anthozoa). Part 1. Establishment of a new family, Myriopathidae. *Zoologische Mededelingen Leiden* 75: 343-370.

Phylum Cnidaria
Class Anthozoa
Order Gorgonacea (gorgonian corals)
Family Coralliidae

***Corallium* spp. (Precious corals) (CLL)**



Distinguishing features: Densely branched coral, usually flattened, with a solid calcareous supporting axis and slender and short terminal branches. Tiny polyps fully retractile in conical apertures sometimes forming bulb-like clusters.

Colour: Pale yellow, pink, or red.

Size: Up to 50 cm.

Distribution: Worldwide (deepwater).

Depth: 100 to 1000 m.

Similar species: Species of *Paracorallium* are indistinguishable from *Corallium* spp. Microscopic examination of sclerites is required for a reliable identification.

References: Bayer, F.M. (1996). Three new species of precious coral (Anthozoa: Gorgonacea, genus *Corallium*) from Pacific waters. *Proceedings of the Biological Society of Washington* 109: 205–228.

Phylum Cnidaria
Class Anthozoa
Order Gorgonacea (gorgonian corals)
Family Paragorgiidae

***Paragorgia arborea* (Bubblegum coral) (PAB)**



Distinguishing features: Robust tree-like colonies up to several metres high with bubble-like concentrations (bulbs) of polyps placed throughout the branches. Colonies up to several metres height (trunk ~ 20–30 cm in diameter). This could be the tallest sessile invertebrate ever found in deepwater.

Colour: Reddish orange.

Size: Up to 5 m.

Distribution: Bipolar (deepwater).

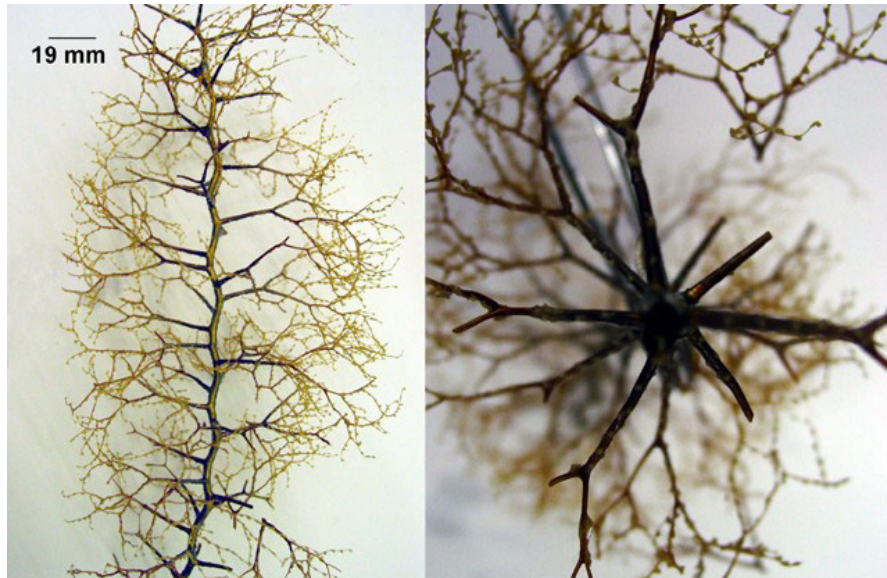
Depth: 200 to 800 m.

Similar species: There are four more species of *Paragorgia* in New Zealand (e.g., *Paragorgia splendens*) none of them attaining more than 50 cm height.

References: Grasshoff, M. (1979). Zur bipolaren Verbreitung der Oktokoralle *Paragorgia arborea* (Cnidaria: Anthozoa: Scleraxonia). *Senckenbergiana Maritima* 11: 115–137.

Phylum Cnidaria
Class Anthozoa
Order Gorgonacea/Calcaxonia (gorgonian corals)
Family Chrysogorgiidae

***Chrysogorgia* spp. (Golden corals) (CHR)**



Distinguishing features: Dark, highly calcified colonies with bottlebrush branching arising from a regular single and ascending spiral around the main branch. Polyps large, relative to branch width, soft, few in number and well spaced from each other.

Colour: Black axis with brilliant metallic lustre from amber to golden colour.

Size: Up to 1 m.

Distribution: Found worldwide. Widely distributed in New Zealand deepsea region.

Depth: 80 to 2000 m.

Similar species: There are several *Chrysogorgia* species in New Zealand waters ranging in appearance from bottlebrush to sea fan colonies. Fan shape colonies could resemble the apical part of *Metallogorgia* spp.

References: Cairns, S.D. (2001). Studies on western Atlantic Octocorallia (Coelenterata: Anthozoa). Part 1: The genus *Chrysogorgia* Duchassaing & Michelotti, 1864. *Proceedings of the Biological Society of Washington* 114: 746–787.

Phylum Cnidaria
Class Anthozoa
Order Gorgonacea/Calcaxonia (gorgonian corals)
Family Isididae

(Bamboo corals) (ISI)



Distinguishing features: Bamboo-like coral, white calcareous nodes with horny (hardened protein) internodes.

Colour: White with dark nodes, living tissue pale yellow to brown.

Size: Up to 3 m.

Distribution: Widely distributed in New Zealand deepsea region on hard seafloor.

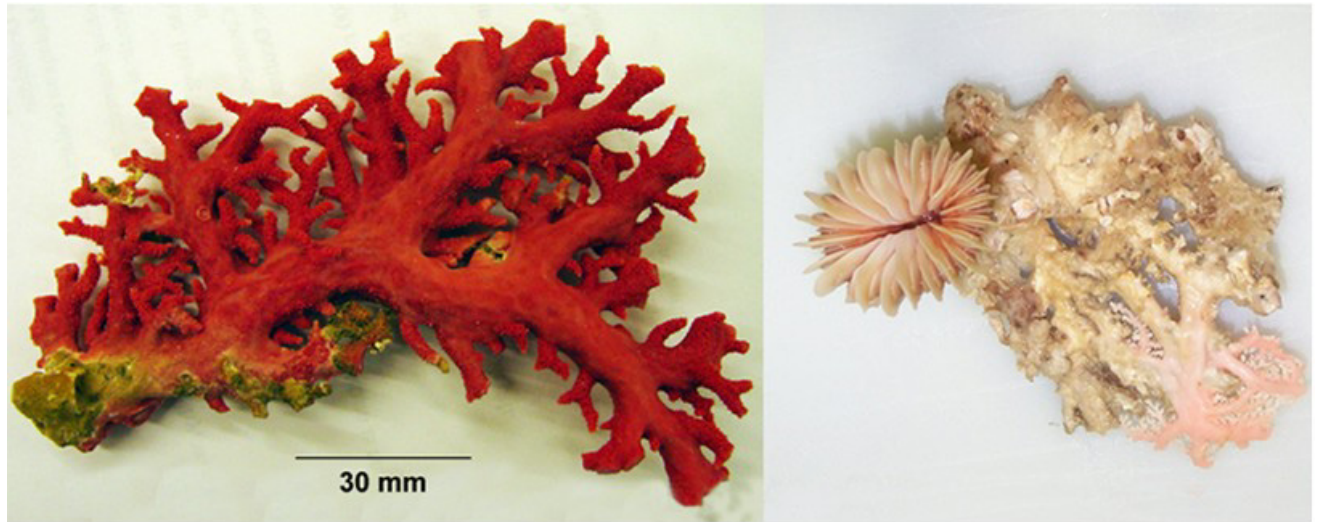
Depth: 200 to 2000 m.

Similar species: The bamboo coral species can be difficult to identify. The genera *Keratoisis*, *Acanella*, and *Lepidisis* are very similar.

References: Grant, R. (1976). The marine fauna of New Zealand: Isididae (Octocorallia: Gorgonacea) from New Zealand and the Antarctic. *New Zealand Oceanographic Institute Memoir* 66. 56 p.

Phylum Cnidaria
Class Hydrozoa
Order Hydroida (hydroids)
Family Stylasteridae

***Errina* spp. (Red hydrocorals) (ERR)**



Distinguishing features: Branching corals, often massive with polyps contained in visible pores usually adjacent to spine-like processes.

Colour: White to red.

Size: Up to 300 mm.

Distribution: The genus is found worldwide. There are many species endemic to New Zealand.

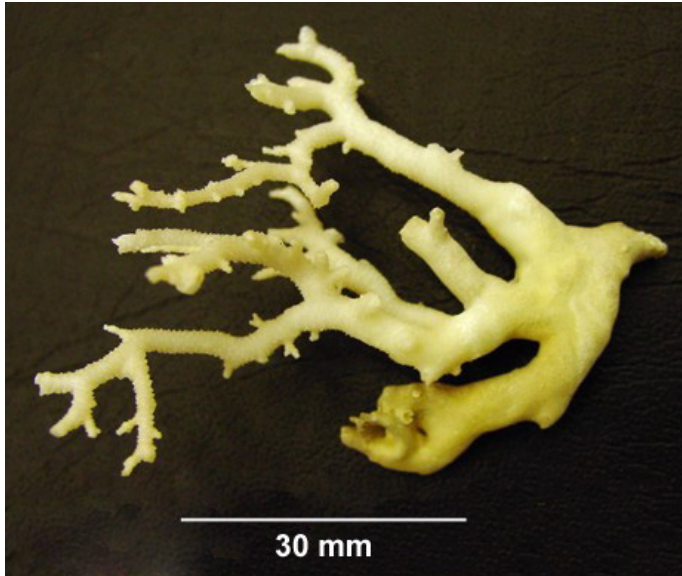
Depth: 10 to 1800 m.

Similar species: Most members of *Errina* appear similar to the naked eye. Microscopic examination is required for reliable identification.

References: Cairns, S.D. (1991). The marine fauna of New Zealand: Stylasteridae (Cnidaria: Hydroida). *New Zealand Oceanographic Institute Memoir* 98. 179 p.

Phylum Cnidaria
Class Hydrozoa
Order Hydroida (hydroids)
Family Stylasteridae

***Lepidotheca* spp. (Spiny white hydrocorals) (LPT)**



Distinguishing features: Robust branching corals with tiny feeding polyps and stinging polyps. Colony surface has a series of long spines.

Colour: White.

Size: Up to 60 mm.

Distribution: The genus is found worldwide. There are many species endemic to New Zealand.

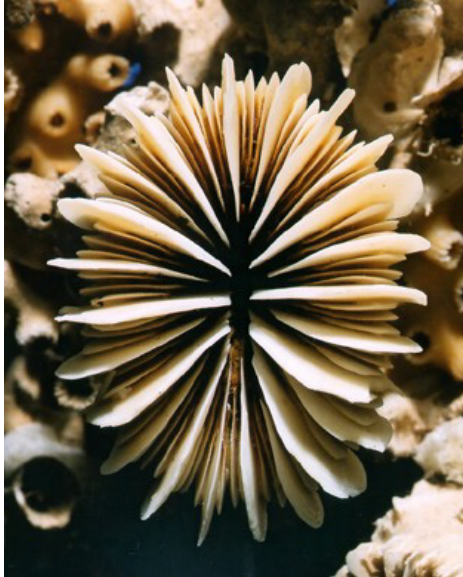
Depth: 80 to 2010 m.

Similar species: Most members of the Family Stylasteridae appear similar to the naked eye (and can resemble some bryozoans!). Microscopic examination is required for reliable identification.

References: Cairns, S.D. (1991). The marine fauna of New Zealand: Stylasteridae (Cnidaria: Hydroida). *New Zealand Oceanographic Institute Memoir* 98. 179 p.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Caryophyllidae

***Desmophyllum dianthus* (Crested cup coral) (DDI)**



Distinguishing features: Solitary coral. Highly variable forms from cylindrical and serpentine to robust and massive. Usually fixed to other corals or gorgonian bases and clumped with other individuals.

Colour: White, pale ochre tissue (if present).

Size: Up to 100 mm.

Distribution: Worldwide, except off continental Antarctica and the northern Pacific.

Depth: 35 to 2460 m.

Similar species: *Desmophyllum striatum* is the other valid species of the genus, but it is only found in the western Atlantic.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Caryophylliidae

***Goniocorella dumosa* (Bushy hard coral) (GDU)**



Distinguishing features: Large bushy colonies, each branch bearing a terminal coral polyp. Most of the branches bud at right-angles and are reinforced by slender tubular bridges that are smooth on the outside.

Colour: Brown to ochre (when alive) with orange polyps.

Size: Up to 400 mm.

Distribution: Widely distributed in New Zealand deepsea region and Indo-Pacific.

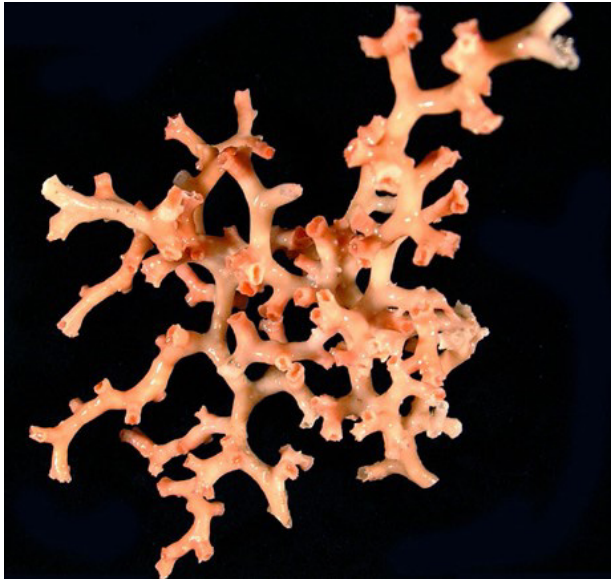
Depth: 300 to 1500 m.

Similar species: *Enallopsamia rostrata* can also form bushy colonies, but branches in a particular uniplanar way and it lacks the tubular bridges. Also similar to other colonial corals such as *Madrepora* and *Solenosmilia*.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Caryophylliidae

***Solenosmilia variabilis* (Deepwater branching coral) (SVA)**



Distinguishing features: Large colonies with equal, three-dimensional branching.

Colour: Pink (when alive).

Size: Up to 20 cm.

Distribution: Cosmopolitan and widely distributed in New Zealand deepsea region.

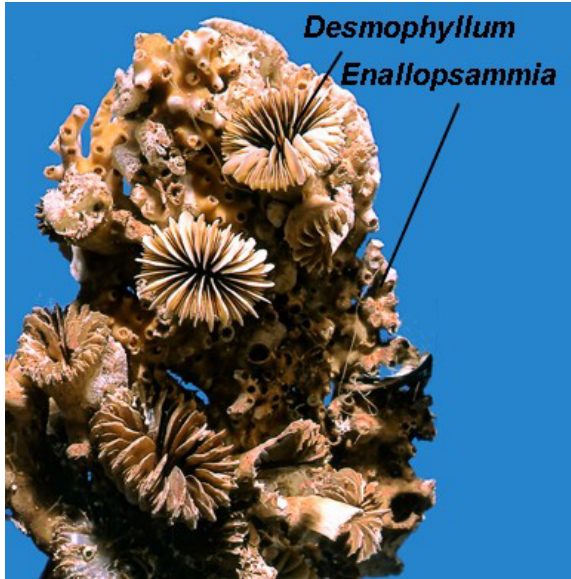
Depth: 220 to 2165 m.

Similar species: *Enallopsamia rostrata* can also form branching colonies, but in a particular uniplanar way and not as dichotomous as *S. variabilis*. Also similar to *Lophelia* and *Madrepora oculata* but the equal, intratentacular branching is distinctive in *S. variabilis*.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Dendrophylliidae

***Enallopsammia rostrata* (Deepwater branching coral) (ERO)**



Distinguishing features: Large uniplanar colonies with occasional branch anastomosis (e.g., branch fusion). Polyp calices (opening of corallite in which polyp is situated) are visible, circular to elliptical, and confined to only one plane of the coral. Ridges on the rostrum. The image shows the crested cup coral *Desmophyllum* colonising *Enallopsammia*.

Colour: Brown to ochre (when alive).

Size: Up to 400 mm.

Distribution: Worldwide.

Depth: 200 to 1500 m.

Similar species: *Goniocorella dumosa* is also a deepwater colonial coral, but it has geometric calcareous bridges among branches whereas *E. rostrata* has uniplanar branching.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Flabellidae

***Flabellum* spp. (Flabellum cup corals) (COF)**



Distinguishing features: Solitary corals, fixed or free with bell-like or compressed form. Growth ridges evident along the external wall. Coral edges can be either continuous or jagged.

Colour: White, tissue pale ochre.

Size: Up to 50 mm.

Distribution: Worldwide. New Zealand has several endemic species.

Depth: 250 to 1500 m.

Similar species: *Rhizotrochus* spp. Microscopic examination is required for reliable identification to species level.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Oculinidae

***Oculina virgosa* (Deepwater branching coral) (OVI)**



Distinguishing features: Branching coral, sometimes sparsely over hard substrate. Terminal branches with sympodially arranged circular calyces.

Colour: Red when alive.

Size: Up to 140 mm.

Distribution: Endemic to New Zealand.

Depth: 40 to 300 m.

Similar species: *Madrepora oculata* is similar to *O. virgosa*, but *M. oculata* is thicker with alternate and well separated calyces. Microscopic examination is required for reliable identification to species level.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Oculinidae

***Madrepora oculata* (Madrepora coral) (MOC)**



Distinguishing features: Branching coral, usually bushy, with multiple small circular coral cups or polyps that alternate on each side of thick branches. Diameter of cups 1.9 to 2.2. mm. Associated with commensal polychaetes.

Colour: White, living tissue light brown.

Size: Up to 150 mm.

Distribution: Worldwide, except Antarctica.

Depth: 150 to 1500 m.

Similar species: *Oculina virgosa* is a similar but more sparsely and irregularly branched species with larger cup diameter (2.5 to 4.5 mm). Microscopic examination is required for reliable identification to species level.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

PHYLUM

Annelida

Sea worms

Phylum Annelida
Class Polychaeta (sea-worms)
Order Eunicida
Family Eunicidae

***Eunice* (undescribed) (Eunice sea-worm) (EUN)**



Distinguishing features: Head with 2 cushion-like palps, 5 head antennae, followed by another pair of antennae. Mouth with white plate-like mandibles below a series of toothed jaw plates. Small comb-like pink gills above each lateral 'leg' from 8th segment to end of body.

Colour: Light chocolate brown with paler underside.

Size: Total length up to 220 mm.

Distribution: Chatham Rise and Bay of Plenty region.

Depth: 200 to 250 m.

Similar species: There are a number of described and undescribed *Eunice* in New Zealand waters of various sizes, all superficially rather similar, but varying in body colour, gill development, and morphology of jaw elements and chaetae (bristles on each segment leg).

References: Fauchald, K. (1992). A review of the genus *Eunice* (Polychaeta: Eunicidae) based upon type material. *Smithsonian Contributions to Zoology* 523. 422 p.

Phylum Annelida
Class Polychaeta (sea-worms)
Order Eunicida
Family Onuphidae

Hyalinoecia tubicola (Quill worm) (HTU)



Distinguishing features: Onuphid worms occupying a tapering quill-like horny tube with protective internal valves at either end (see mid left specimen inside tube). Tube is translucent and circular in cross-section. Worm is an active crawler, dragging tube "house" along.

Colour: Light brown tube and body.

Size: Total length up to 300 mm (tube length).

Distribution: Common on the surface of sediments of New Zealand continental slope.

Depth: 50 to 2800 m. 80% of records occur in the depth zone 100 to 600 m.

Similar species: *Hyalinoecia incubans*, a smaller species, is very similar. *Leptoecia oxyrhincha* is also smaller and occupies a similar, though flattened, "quill" tube. *H. tubicola* is apparently "cosmopolitan," with the New Zealand form a subspecies, *H. tubicola longibranchiata*.

References: McIntosh, W.C. (1885). Report on the Annelida Polychaeta collected by H.M.S. 'Challenger' during the years 1873–76. *Report of the Scientific Results of the Exploring Voyage of H.M.S. Challenger 1873–76* 12. 554 p.

Read, G.B. ; Clark, H.E.S. (1999). Ingestion of quill-worms by the astropectinid sea-star *Proserpinaster neozelanicus* (Mortensen). *New Zealand Journal of Zoology* 26: 49–54.

Phylum Annelida
Class Polychaeta (sea-worms)
Order Phyllodocida
Family Polynoidae

***Thermiphione* (undescribed) (Thermiphione scaleworm) (THE)**



Distinguishing features: Thirteen pairs of overlapping tough dorsal scales, each with a polygonal surface pattern (image inset top R). Dorsal surface under scales (absent in left lower specimen and head-closeup, R image) with near-midline papillae. Head without eyes or antennae, with pair of palps.

Colour: Golden dorsal scales. Body reportedly green in life.

Size: Total length up to 30 mm. About twice as long as wide.

Distribution: Eastern New Zealand on actively volcanic seamounts.

Depth: 230 to 730 m.

Similar species: No other member of genus recorded in New Zealand. However, many Polynoidae look superficially the same if dorsal scales are intact.

References: Hartmann–Schröder, G. (1992). Zur Polychaetenfauna in rezenten hydrothermalen Complexmassivsulfiderzen ('Schwarze Raucher') am Ostpazifischen Rücken bei 21° 30' S. *Helgoländer Meeresuntersuchungen* 46: 389–403.

Miura, T. (1994). Two new scale-worms (Polynoidae, Polychaeta) from the Lau Back-Arc and North Fiji Basins, south Pacific Ocean. *Proceedings of the Biological Society of Washington* 107: 532–543.

PHYLUM

Mollusca

Snails, sea slugs, chitons, bivalves, octopus

Phylum Mollusca
Class Amphineura (chitons)
Order
Family

(Chiton) (CHT)



Distinguishing features: Symmetrical with an ovoid body and no eyes or tentacles. The shell is divided into 8 overlapping plates. Will be attached to some form of hard substrate.

Colour: Generally dull brown or greenish, but may be red or brighter colours.

Size: From 20 to 110 mm.

Distribution: Worldwide.

Depth: Intertidal to deepwater

Similar species: A generic image of a chiton is shown. There are several genera found in the New Zealand region.

References: Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

Phylum Mollusca
Class Bivalvia (bivalves)
Order Pholadomyoidea
Family Euciroidae

***Euciroa galathea* (EGA)**



Distinguishing features: Shell more or less oval, swollen, sculptured with very fine radial ribs. Fresh uneroded specimens covered with a rough surface caused by densely crowded, minute granules.

Colour: Shell white or pale pink.

Size: Total length up to 63 mm.

Distribution: Eastern North and South Islands, Chatham Rise, and Auckland Islands.

Depth: 400 to 620 m.

Similar species: Hitherto unrecorded species with heavier, more circular shell, occurs on Challenger Plateau and northern seamounts.

References: Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

Phylum Mollusca
Class Bivalvia (bivalves)
Order Limoida
Family Limidae

***Acesta maui* (Giant file shell) (AMA)**



Distinguishing features: Thin, rather fragile shell, externally with very fine longitudinal ridges near sides. Darker markings are due to the presence of a thin external skin, which is much softer than the shell and erodes away easily, especially in more dynamic environments. The external skin is typically best preserved in small to medium-sized specimens.

Colour: Shell white, typically with a patchy, dull brownish external skin.

Size: Total length up to 185 mm.

Distribution: Cook Strait, eastern South Island, Fiordland, Chatham Rise, and Auckland and Campbell Islands.

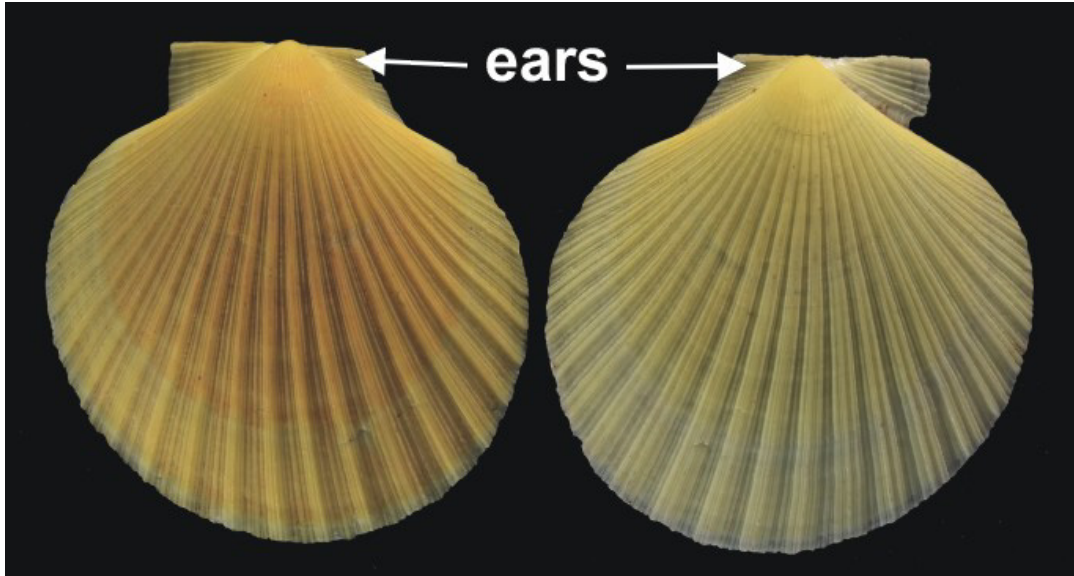
Depth: 270 to 1170 m.

Similar species: *Acesta saginata* Marshall, 2001.

References: Marshall, B.A. (2001). The genus *Acesta* H. & A. Adams, 1858 in the southwest Pacific (Mollusca: Bivalvia: Limidae). In, Bouchet, P.; Marshall, B.A. (eds), Tropical deep-sea benthos 22. *Memoires de la Muséum National d'Histoire Naturelle* 185: 97–109.

Phylum Mollusca
Class Bivalvia (bivalves)
Order Ostreoida
Family Pectinidae

***Zygochlamys delicatula* (ZDE)**



Distinguishing features: Scallop or fan-shaped shell covered with longitudinal riblets, both valves (halves) inflated; ears on each valve of unequal size.

Colour: Yellow or red.

Size: Total length up to 97 cm.

Distribution: Eastern South Island, western Chatham Rise, Auckland, Bounty, and Campbell Islands, and Macquarie Island.

Depth: 60 to 549 m.

Similar species: *Veprichlamys kiwaensis*, *Talochlamys dichroa*, *Talochlamys zelandiae*, *Talochlamys zelandiae*, *Mesopeplum convexum*.

References: Beu, A. G. (1985). Pleistocene *Chlamys patagonica delicatula* (Bivalvia: Pectinidae) off southeastern Tasmania, and history of its species group in the Southern Ocean. In: Lindsay, J.M. (ed.). Stratigraphy, palaeontology, malacology. Papers in honour of Dr Nell Ludbrook. *Department of Mines and Energy, South Australia, Special Publication 5*. 1–11.

Jonkers, H.A. (2003). Late Cenozoic–Recent Pectinidae (Mollusca: Bivalvia) of the Southern Ocean and neighbouring regions. *Monographs of Marine Mollusca 5*. 91 p.

Phylum Mollusca
Class Cephalopoda
Order Incirrata
Family Bathypolypodinae

***Benthoctopus tegginmathae* (Deepwater octopus) (BTE)**



Distinguishing features: Stocky bodied with big head and short arms, skin smooth.

Colour: Dark red on undersurfaces of mantle, head, arms, and web and light red on other surfaces.

Size: Total length up to 330 mm.

Distribution: Bay of Plenty to the Chatham Rise.

Depth: 800 to 1750 m.

Similar species: Several *Benthoctopus* species recorded in New Zealand waters including *B. tangaroa*.

References: O'Shea, S. (1999). The marine fauna of New Zealand: Octopoda (Mollusca: Cephalopoda). *NIWA Biodiversity Memoir 112*. 280 p.

Phylum Mollusca
Class Cephalopoda
Order Incirrata
Family Octopodidae

***Enteroctopus zealandicus* (Yellow octopus) (EZE)**



Distinguishing features: A large smooth-bodied octopus with broad, ovoid mantle, arms subequal in length; all arm pairs consist of suckers of similar size.

Colour: Yellow to orange.

Size: Mantle length up to 1.4 m.

Distribution: East coast South Island, Chatham Rise, Southern Plateau.

Depth: 50 to 600 m.

Similar species: *Enterocotopus megalocyathus*.

References: O'Shea, S. (1999). The marine fauna of New Zealand: Octopoda (Mollusca: Cephalopoda). *NIWA Biodiversity Memoir 112*. 280 p.

Phylum Mollusca
Class Cephalopoda
Order Incirrata
Family Octopodidae

***Graneledone* spp. (Deepwater octopus) (DWO)**



Distinguishing features: Clusters of cartilage-like processes on the head, mantle, and arms; have a single row of suckers down each arm and lack an ink sack.

Colour: Maroon to light to dark red.

Size: Total length up to 610 mm. Moderate to large size.

Distribution: Primarily east coast North Island, East Cape to Chatham Rise.

Depth: 750 to 1500 m.

Similar species: A few *Graneledone* have been identified to species in the New Zealand region, including *Graneledone challengerii* and *G. taniwha taniwha*.

References: O'Shea, S. (1999). The marine fauna of New Zealand: Octopoda (Mollusca: Cephalopoda). *NIWA Biodiversity Memoir 112*. 280 p.

Phylum Mollusca
Class Cephalopoda
Order Incirrata
Family Octopodidae

***Pinnoctopus cordiformis* (Common octopus) (OCT)**



Distinguishing features: Animal attains massive size; arms slender, tapering to delicate tips.

Colour: Light dark brown to red.

Size: Total length up to 1.5 m.

Distribution: North Island, South Island, Stewart and Chatham Islands.

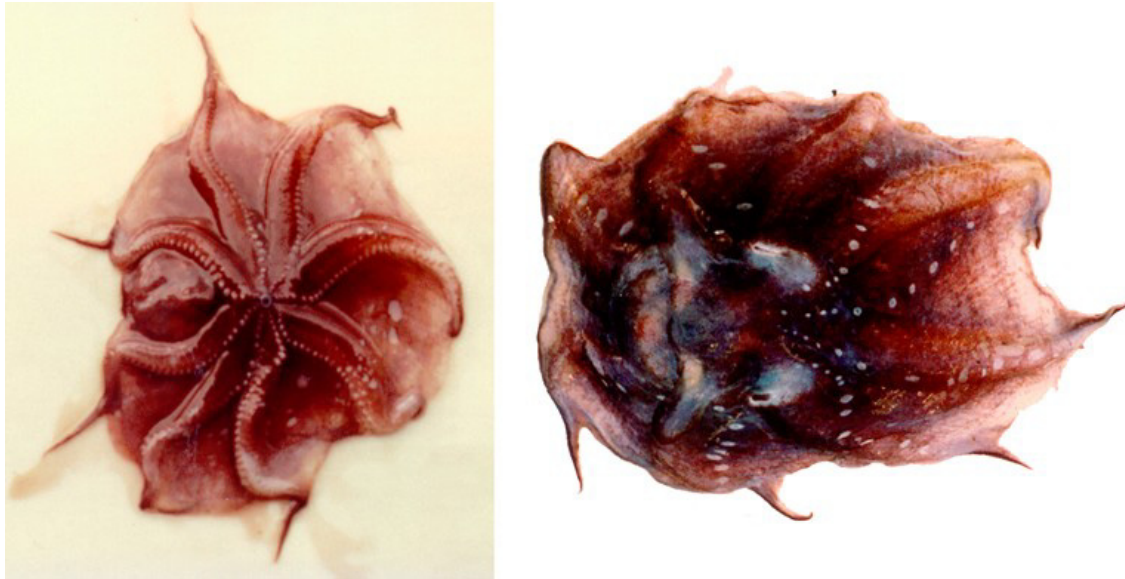
Depth: 5 to 400 m.

Similar species: *Pinnoctopus kermadecensis*.

References: O'Shea, S. (1999). The marine fauna of New Zealand: Octopoda (Mollusca: Cephalopoda). *NIWA Biodiversity Memoir 112*. 280 p.

Phylum Mollusca
Class Cephalopoda
Order Octopoda
Family Opisthoteuthididae

***Opisthoteuthis* spp. (Umbrella octopus) (OPI)**



Distinguishing features: A moderate-sized octopus with very compressed bell- or disc-shaped body. Fins small, flap-like; arms long and deeply embedded in gelatinous web of the mantle tissue; spots can be visible over mantle.

Colour: Purplish red to pink.

Size: Mantle length up to 120 mm.

Distribution: North and South Island regions (both east and west coasts), Chatham Rise, Campbell Plateau.

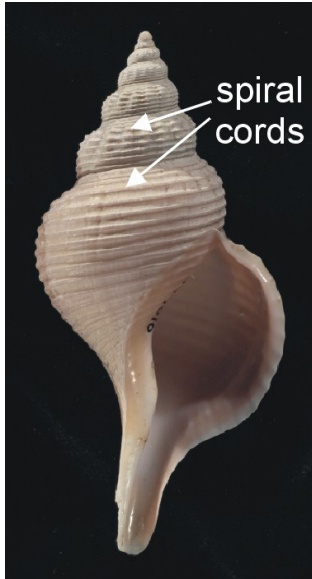
Depth: 400 to 1000 m.

Similar species: Several species recognised in New Zealand waters, including *Opisthoteuthis mero*, *O. agassizii*, *O. vossi*, *O. persephone*, and *O. phillipi*.

References: O'Shea, S. (1999). The marine fauna of New Zealand: Octopoda (Mollusca: Cephalopoda). *NIWA Biodiversity Memoir* 112. 280 p.

Phylum Mollusca
Class Gastropoda (gastropods)
Order Neogastropoda
Family Buccinidae

***Aeneator recens* (AER)**



Distinguishing features: Shell covered with well developed, rather widely spaced spiral cords, and with longitudinal ribs of variable development; no nodules where the ribs cross one another. Base of aperture extended as a rather straight but oblique canal of moderate length.

Colour: Shell pinkish white.

Size: Total height up to 72 mm.

Distribution: Eastern North and South Islands, Stewart Island, and Chatham Rise.

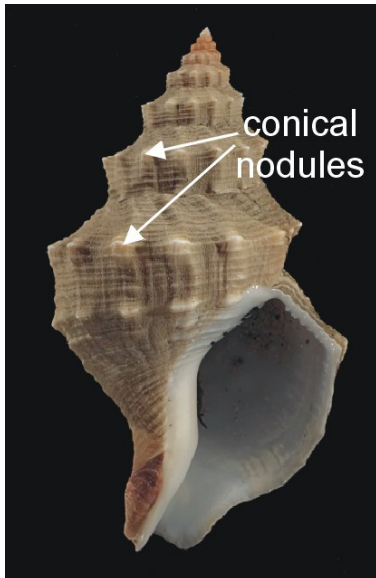
Depth: 300 to 700 m.

Similar species: *Aeneator otagoensis*. Note *Aeneator benthicola* is the same species.

References: Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

Phylum Mollusca
Class Gastropoda (gastropods)
Order Neogastropoda
Family Buccinidae

Austrofuscus glans (KWH)



Distinguishing features: Shell sculptured with fine spiral ribs and rounded longitudinal ribs, and 2 rows of rounded or conical nodules (1 on middle of each turn on spire, 2 or 3 on last turn). Base of aperture extending as a short, twisted canal. Fresh specimens with a thin, yellowish brown or blackish outer skin.

Colour: Shell whitish or yellowish brown beneath (fresh specimens) thin, outer yellowish-brown or blackish skin.

Size: Total height up to 93 mm.

Distribution: North, South, Stewart, and Chatham Islands.

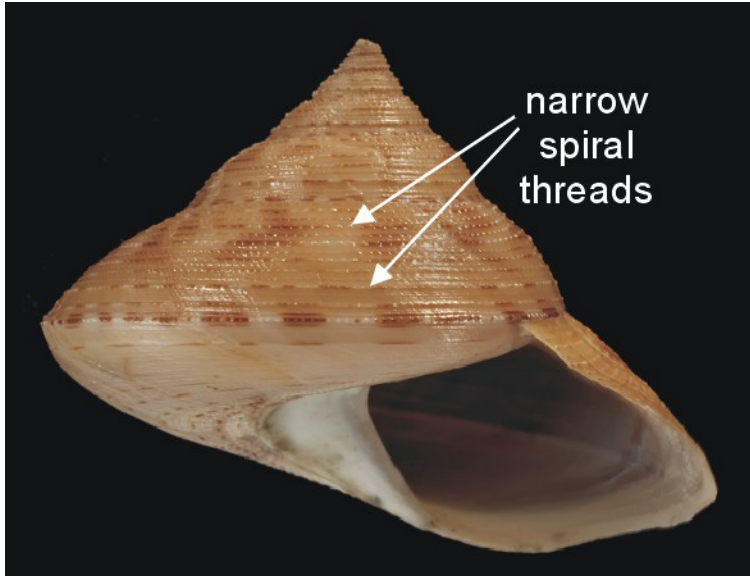
Depth: 0 to 420 m.

Similar species: None.

References: Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

Phylum Mollusca
Class Gastropoda (gastropods)
Order Vetigastropoda
Family Calliostomatidae

Calliostoma turnerarum (CTN)



Distinguishing features: Shell top-shaped, edge angulate, sculptured with narrow spiral threads covered with many small nodules.

Colour: Spire yellowish brown or light orange brown with reddish brown and white spots and streaks. Base (aperture side) whitish with yellowish to reddish brown streaks. Aperture pearly within.

Size: Diameter up to 85 mm.

Distribution: Three Kings Islands, northeastern North Island as far south as Cape Runaway, and off Ninety Mile Beach.

Depth: 230 to 530 m.

Similar species: *Calliostoma selectum*, *C. waikanae*.

References: Marshall, B.A. (1995). A revision of the Recent Calliostomatidae of New Zealand (Mollusca: Gastropoda: Trochoidea). *The Nautilus* 108: 83–126.

Phylum Mollusca
Class Gastropoda
Order Nudibranchia
Family

(Sea slug, Nudibranch) (NUD)



Distinguishing features: The shell may be completely lacking (cf. with other gastropods) or very small and concealed within the body. They may be brilliantly coloured and decorated with numerous spiky projections called cerata.

Colour: Can be red, yellow, pink, orange, green, blue, spotted, white, purple in life, but lose colour when preserved.

Size: Total length from 2 to 15 cm.

Distribution: Worldwide.

Depth: Intertidal to deepwater.

Similar species: Could be mistaken for sea cucumbers, but can be distinguished by their strong, muscular snail-like foot.

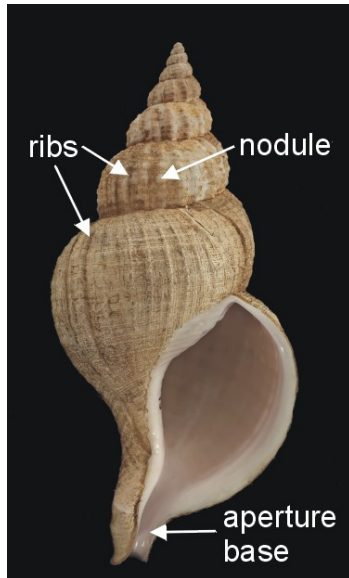
References: Willan, R.C. (1983). New Zealand side-gilled sea slugs (Opisthobranchia: Notaspidea: Pleurobranchidae). *Malacologia* 23: 221–270.

Willan, R.C.; Coleman, N. (1984). Nudibranchs of Australasia. Australasian Marine Photographic Index, Sydney. 56 p.

Willan, R.C.; Morton, J.E. (1984). Marine molluscs Part 2: Opisthobranchia. University of Auckland, Leigh Marine Laboratory, Leigh, New Zealand. 106 p.

Phylum Mollusca
Class Gastropoda (gastropods)
Order Littorinimorpha
Family Ranellidae

***Fusitriton magellanicus* (FMA)**



Distinguishing features: Shell sculptured with fine longitudinal and spiral ribs bearing small, rounded nodules. Base of aperture extending as a twisted canal of moderate length. Fresh specimens with a rather thick, yellowish brown, furry outer skin.

Colour: Shell whitish, typically with yellowish brown, furry outer skin; aperture white or lavender within.

Size: Total height up to 120 mm.

Distribution: Throughout the New Zealand region.

Depth: 300 to 1000 m.

Similar species: This species is also known in the literature as *Fusitriton laudandum* or *F. retiolus*.

References: Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

Phylum Mollusca
Class Gastropoda (gastropods)
Order Neogastropoda
Family Turbinellidae

Coluzea mariae (CMR)



Distinguishing features: Conical spire sculptured with longitudinal and spiral ribs, with small, sharp, conical nodules where the ribs cross. Base of aperture extended as a very long, straight canal.

Colour: Shell typically whitish or greyish white.

Size: Total height up to 98 mm.

Distribution: Eastern South Island, Chatham Rise, and Auckland Islands.

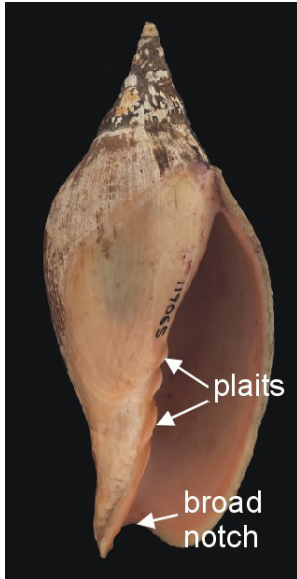
Depth: 180 to 700 m.

Similar species: *Coluzea spiralis*, *C. wormaldi*, *C. altocanal*, *Columbarium veridicum*.

References: Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

Phylum Mollusca
Class Gastropoda (gastropods)
Order Neogastropoda
Family Volutidae

Alcithoe larochei (ALL)



Distinguishing features: Typically no nodules on the spire. Broad notch at base of aperture; 5 or 6 rounded plaits on wall of left (inner) side of the aperture.

Colour: Whitish shell, typically more or less covered with blackish skin.

Size: Total height up to 165 mm.

Distribution: Eastern North Island and northeastern South Island.

Depth: 200 to 650 m.

Similar species: *Alcithoe jaculoides*, *A. arabica*, *A. fissurata*, *A. benthicola*, *A. fusus*, *A. wilsonae*.

References: Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

Phylum Mollusca
Class Gastropoda (gastropods)
Order Neogastropoda
Family Volutidae

***Provocator mirabilis* (Golden volute) (GVO)**



Distinguishing features: Highly polished and smooth. No nodules on the spire. Small notch at base of aperture; no plaits on wall of left (inner) side of the aperture.

Colour: Typically orange, occasionally white.

Size: Total height up to 160 mm.

Distribution: Eastern North and South Islands, Chatham Rise, and Auckland Islands.

Depth: 250 to 790 m.

Similar species: *Alcithoe* spp.

References: Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

PHYLUM

Arthropoda

Sea spiders, isopods, amphipods, prawns,
lobsters, hermit crabs, barnacles

Phylum

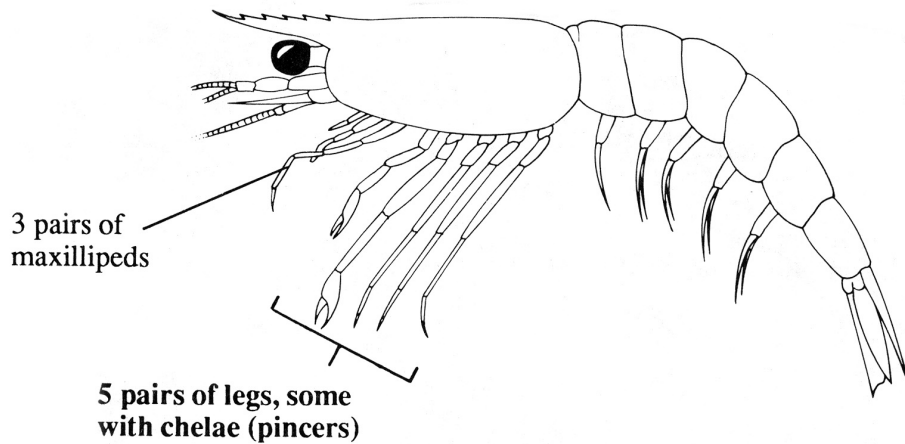
Arthropoda

Shrimp and prawn species

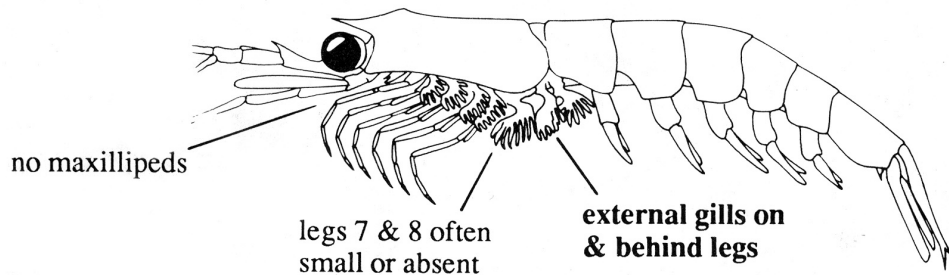
Natant decapods are similar in appearance to crustaceans in two other orders; the Euphausiacea (euphausids) and Mysidacea (mysids). The most obvious characters unique to natant decapods, to mysids, or to euphausids are labelled — **bold** labels indicate the most distinctive character of each.

Reproduced from: Webber, W.R.; Fenaughty, C.M.; Clark, M.R. (1990). A guide to some common offshore shrimp and prawn species of New Zealand. *New Zealand Fisheries Occasional Publication* 6. 42 p.

Decapoda
natant decapods
natants
shrimps
prawns

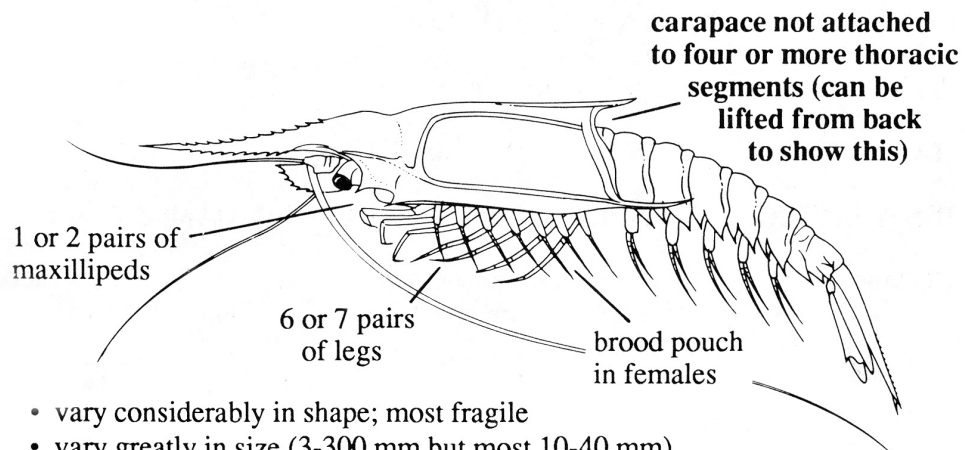


Euphausiacea
euphausids
krill - but not 'lobster krill'



- all fairly similar looking (none uniform scarlet)
- mostly 10-25 mm (largest 50 mm, smallest 8 mm)
- typically pelagic (swimming) in surface to deep water
- often in very large numbers

Mysidacea
mysids
opossum shrimps



- vary considerably in shape; most fragile
- vary greatly in size (3-300 mm but most 10-40 mm)
- pelagic (swimming) or benthic (bottom living) from river mouths to very deep water
- occasionally in large numbers

Phylum Arthropoda
Class Malacostraca
Order Amphipoda (amphipods)
Family Lysianassidae

***Eurythenes gryllus* (EUG)**



Distinguishing features: Compact body, large size. Mouthparts form a quadrate bundle. The first article of the second antenna is swollen. First side plate (coxa 1) is strongly shortened and partly covered by the second side plate (coxa 2). The first leg, gnathopod 1, is short and poorly subchelate. Telson is elongated and deeply cleft.

Colour: Adults red, immatures often white.

Size: Total length up to 100 mm.

Distribution: Widespread at abyssal depths (200 to 6000 m).

Depth: 180 to 6500 m.

Similar species: Other lysianassid amphipods.

References: Barnard, J.L. (1961). Gammaridean amphipoda from depths of 400–6000 meters. *Galathea Reports* 5: 23–128.

Barnard, J.L., Karaman, G.S. (1991). The families and genera of marine gammaridean amphipoda (except marine gammaroids) Part 2. *Records of the Australian Museum, Supplement 13 (Part 2)*: 419–866.

Phylum Arthropoda
Class Crustacea
Order Anomura (false crabs)
Family Paguridae

***Diacanthurus rubricatus* (Hermit crab) (DIR)**



Distinguishing features: Antennules white, eyestalks white with red longitudinal stripes, antennae reddish-brown, chelae and legs yellow-brown with bright red bands on distal ends.

Colour: Reddish-brown with pink and red markings.

Size: From 2 to 18 mm. Measurement is shield length (SL), measured from the tip of the rostrum to the midpoint of the posterior margin of the shell.

Distribution: Apparently endemic to New Zealand. Three Kings Islands to Stewart Island and east to the Chatham Islands.

Depth: 15 to 2200 m. Most collected between 180 and 300 m.

Similar species: Other pagurid species.

References: Forest, J.; de S. Laurent, M.; McLaughlin, P.A.; Lemaitre, R. (2000). The marine fauna of New Zealand: Paguridea (Decapoda: Anomura) exclusive of the Lithodidae. *NIWA Biodiversity Memoir 114*. 250 p.

Phylum Arthropoda
Class Crustacea
Order Decapoda (false crabs)
Family Parapaguridae

***Sympagurus dimorphus* (Hermit crab) (SDM)**



Distinguishing features: Large-bodied, chelipeds markedly dissimilar and hairy. Right cheliped massive. Walking legs overreach extended right cheliped. Tail fan (telson and uropods) markedly asymmetrical.

Colour: Overall colour of body cream.

Size: Carapace length up to 30 mm. Most commonly up to 20 mm carapace length.

Distribution: The most abundant parapagurid in New Zealand waters, found on soft sediment and seamount environments. Widespread in southern hemisphere.

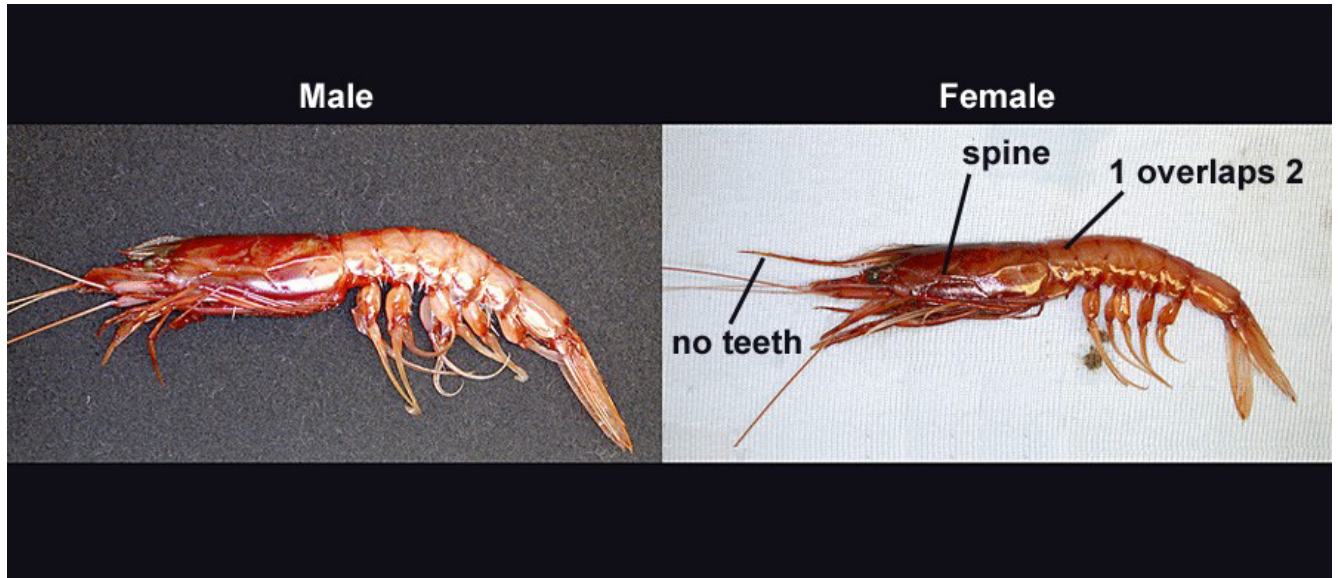
Depth: 90 to 2000 m. New Zealand records 200 to 1000 m.

Similar species: At least 5 other parapagurid species.

References: Forest, J.; Laurent, M. de S.; McLaughlin, P.A.; Lemaitre, R. (2000). The marine fauna of New Zealand: Paguridea (Decapoda: Anomura) exclusive of the Lithodidae. *NIWA Biodiversity Memoir 114*. 250 p.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Aristaeidae

***Aristaeomorpha foliacea* (Royal red prawn) (AFO)**



Distinguishing features: Rostrum is long and slender in females, with more than 3 teeth on top and none on the bottom; males have a short rostrum. There is one small hepatic spine on the side of the carapace; abdominal segment 1 overlaps segment 2; legs 1 to 3 have small chelae (pincers).

Colour: A fairly uniform red over the whole body.

Size: Total length up to 230 mm (includes rostrum).

Distribution: A worldwide species. In New Zealand waters it has occasionally been caught on the Chatham Rise and Challenger Plateau, but typically occurs north of Cook Strait, with frequent records in the Bay of Plenty.

Depth: 250 to 1400 m. Most frequently recorded between 400 and 1100 m.

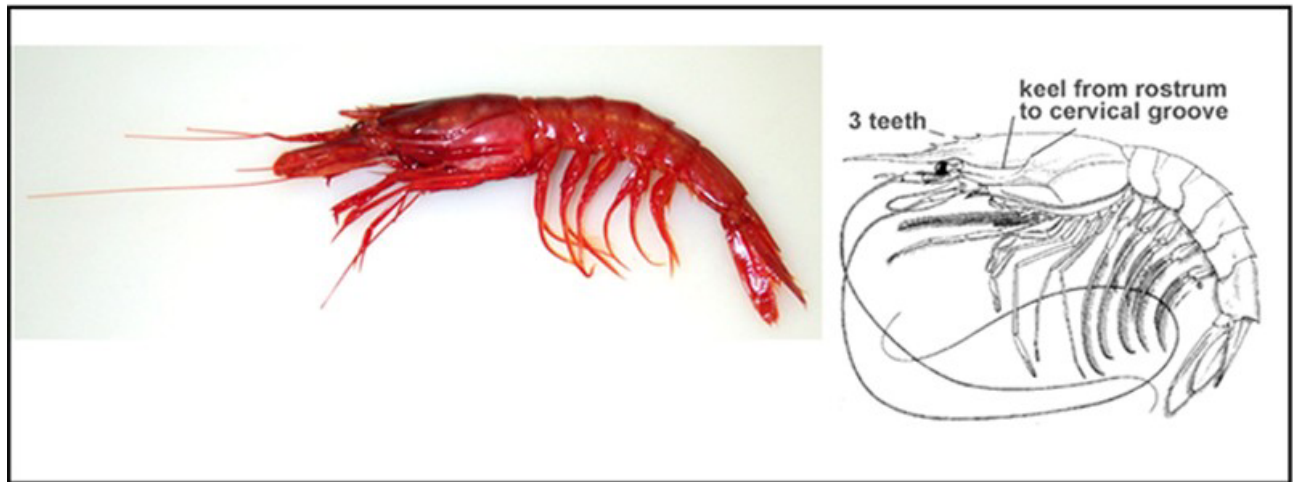
Similar species: *Aristaeopsis edwardsiana* (and *Aristeus* spp.) have only 3 teeth on top of the rostrum, and do not have an hepatic spine. *Nematocarcinus* spp. appear similar, but abdominal segment 2 overlaps segment 1, there usually a few small teeth spread along the bottom of the rostrum, only legs 1 and 2 have chelae, legs 3–5 very long.

References: Webber, W.R. (2002). Prawns coming in from the cold (Pt 1). *Seafood New Zealand* 10(9): 75–78.

Webber, W.R.; Fenaughty, C.M.; Clark, M.R. (1990). A guide to some common offshore shrimp and prawn species of New Zealand. *New Zealand Fisheries Occasional Publication* 6. 42 p.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Aristeidae

Aristaeopsis edwardsiana (Scarlet prawn) (PED)



Distinguishing features: The base of the rostrum has 3 teeth on top, above the eye. The sides of the carapace have several keels, including one which runs from the rostrum to the cervical groove.

Colour: Uniformly scarlet to bright red, to deep crimson.

Size: Total length up to 350 mm.

Distribution: Worldwide distribution. Occurs in deep water around much of New Zealand. Distribution is continuous around the North Island and extends out to the Chatham Rise and Challenger Plateau. Puysegur Bank is the most southern record.

Depth: 200 to 1800 m. Most commonly taken between 900 and 1100 m.

Similar species: *Aristeus* spp. are very similar in shape and features. They are generally smaller bodied, and do not have the keel on the carapace from the rostrum to the cervical groove (keel either absent or very short and not reaching cervical groove).

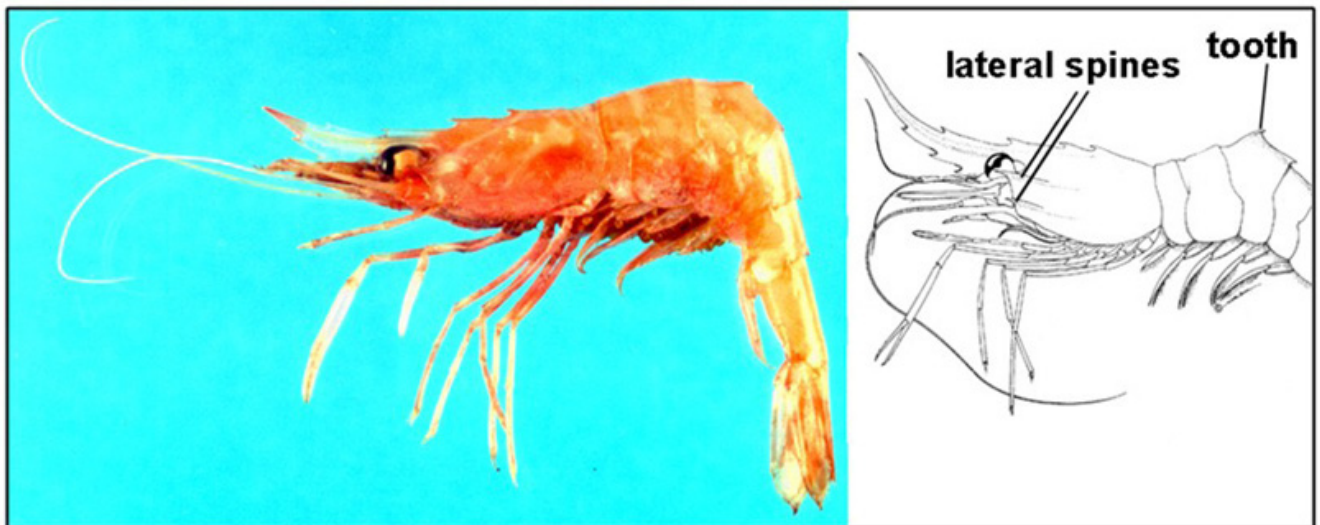
References: Perez Farfantes, I.; Kensley, B. (1997). Penaeoid and sergestoid shrimps and prawns of the world: keys and diagnostics for the families and genera. *Memoires du Museum National d'Histoire Naturelle* 175. 233 p.

Webber, W.R.; Fenaughty, C.M.; Clark, M.R. (1990). A guide to some common offshore shrimp and prawn species of New Zealand. *New Zealand Fisheries Occasional Publication* 6. 42 p.

Webber, W.R. (2002). Prawns coming in from the cold (Pt 2). *Seafood New Zealand* 10(10): 70–71.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Campylonotidae

***Campylonotus rathbunae* (Sabre prawn) (CAM)**



Distinguishing features: A distinctive heavy-bodied and well armed species. It has a rigid carapace and blade-like rostrum. Two strong lateral spines on the carapace. The 3rd abdominal segment has a pronounced tooth.

Colour: Body pink to yellow-orange. Tip of rostrum is orange to red.

Size: Total length up to 140 mm (includes rostrum).

Distribution: Endemic to Australasia, occurring off New Zealand and eastern and southern Australia. Around New Zealand it has been recorded from Northland south (especially in the Bay of Plenty), Chatham Rise to Campbell Plateau. Not known from Challenger Plateau or Kermadec region.

Depth: 270 to 800 m. Most common at depths of 400 to 600 m.

Similar species: None. It is the only member of its family in New Zealand waters.

References: Webber, W.R. (2002). Prawns coming in from the cold (Pt 1). *Seafood New Zealand* 10(9): 75–78.

Yaldwyn, J.C. (1960). Crustacea Decapoda Natantia from the Chatham Rise: a deep water bottom fauna from New Zealand. *New Zealand DSIR Bulletin* 139: 13–53.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Glyphocrangonidae

***Glyphocrangon lowryi* (Goblin prawn) (GLO)**



Distinguishing features: Prominent rostral spine, about half carapace length, with 2 pairs of lateral spines. Large lateral carapace flange just posterior to eye, with smaller one half-way to posterior of carapace. Median carina on abdomen segments, spine-like on first segment.

Colour: Carapace yellowish, otherwise the prominent colour is the scarlet of the spine tips against a yellowish background.

Size: Carapace length up to 35 mm.

Distribution: Northern New Zealand continental slope and seamounts, and off Queensland.

Depth: 720 to 980 m.

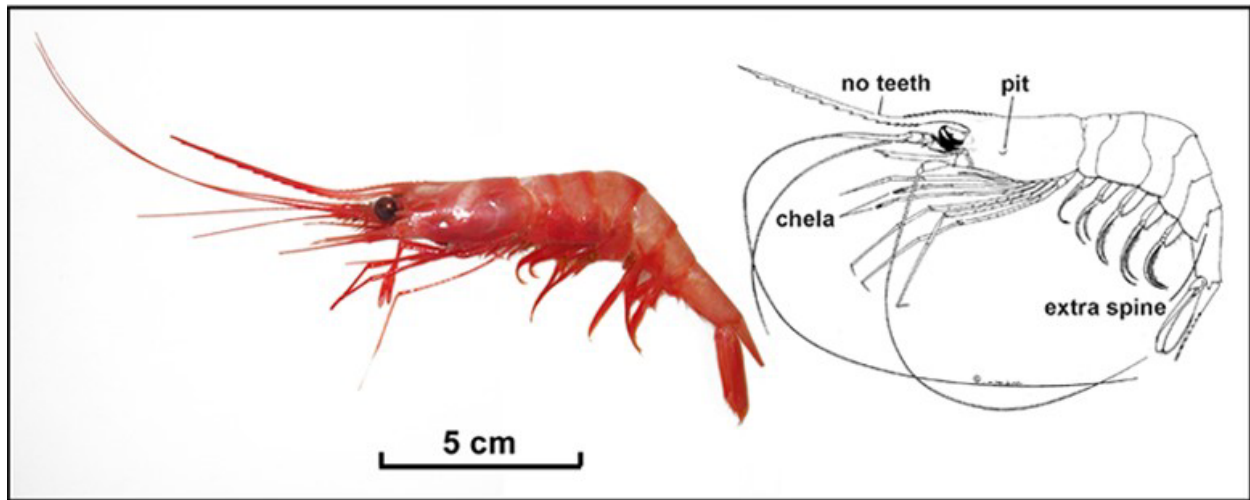
Similar species: Several species in New Zealand waters, many undescribed/unidentified.

References: Kensley, B.; Tranter, H.A.; Griffin, D.J.G. (1987). Deepwater decapod Crustacea from eastern Australia (Penaeidae and Caridae). *Records of the Australian Museum* 39: 263–331.

Takeda, M. (1990). Fishes collected by the R/V *Shinkai Maru* around New Zealand. Japan Marine Fishery Resource Research Centre (JAMARC). 410 p.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Nematocarcinidae

Lipkius holthuisi (Omega prawn) (LHO)



Distinguishing features: Second abdominal side plate overlaps the first, long rostrum with teeth (>10) along the bottom spread out towards tip. Top of rostrum has no teeth for most of its length. Carapace has small pit on side, 5th abdominal segment has an extra spine, first and second legs have chelae (but these features hard to see without magnifying glass).

Colour: Anterior half of body is red, with abdomen partly red, partly colourless.

Size: Total length up to 200 mm (includes rostrum).

Distribution: Endemic to Australasia. Around New Zealand it is distributed south of 37° S. Found almost continuously along margin of continental slope from East Cape southwards, along the Chatham Rise, around the Campbell Plateau, out to Challenger Plateau.

Depth: 350 to 1200 m. Most common 800 to 1000 m.

Similar species: *Nematocarcinus* spp. in the same family, but have teeth on top of rostrum out to tip. *Plesionika martia* has many small teeth on the bottom of rostrum.

References: Webber, W.R. (2002). Prawns coming in from the cold (Pt 1). *Seafood New Zealand* 10(9): 75–78.

Webber, W.R.; Fenaughty, C.M.; Clark, M.R. (1990). A guide to some common offshore shrimp and prawn species of New Zealand. *New Zealand Fisheries Occasional Publication* 6. 42 p.

Yaldwyn, J.C. (1960). Crustacea Decapoda Natantia from the Chatham Rise: a deep water bottom fauna from New Zealand. *New Zealand DSIR Bulletin* 139: 13–53.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Nematocarcinidae

***Nematocarcinus* spp. (Spider prawns) (NEC)**



Distinguishing features: Teeth on top of rostrum extend right out to the tip; bottom of rostrum with none or a few teeth; legs 3, 4, 5 are very long (often broken); legs 1 and 2 have chelae (pincers); abdominal segment 2 overlaps segment 1.

Colour: Body red, orange to yellow area under carapace, abdomen partly red, partly colourless.

Size: Total length up to 170 mm (includes rostrum).

Distribution: Found worldwide. Around New Zealand they occur in small numbers around the margins of the continental shelf off the Chatham Rise, Challenger Plateau, and west coast of the South Island.

Depth: 800 to 1200 m. Mostly occurs 900 to 1100 m.

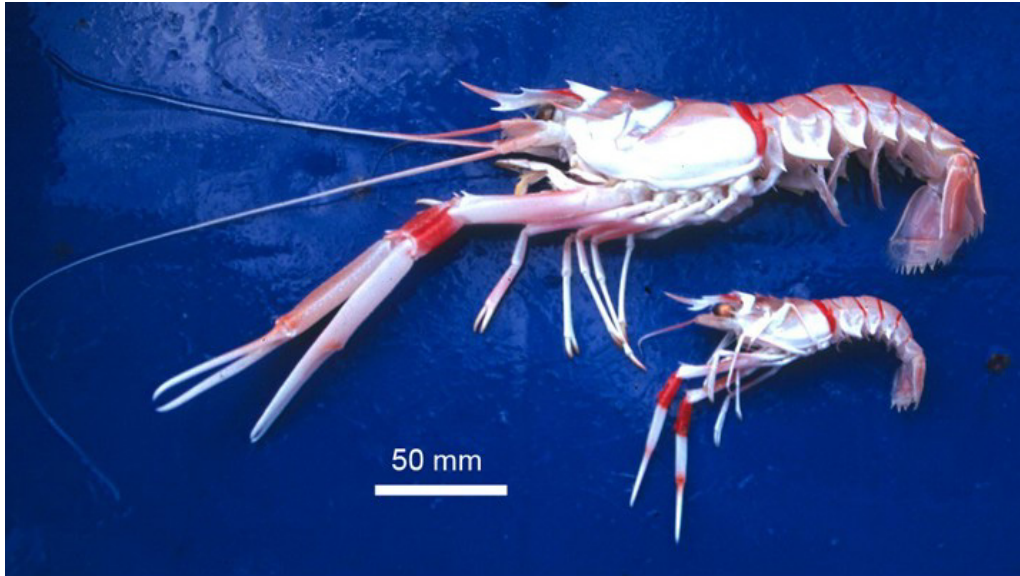
Similar species: There are five species in this genus known from the New Zealand region. *Lipkius holthuisi*, *Notopandalus magnoculus*, and *Plesionika martia* have a similar shape, but the teeth on top of the rostrum do not extend out to the tip, and they have more than 10 teeth on the bottom of the rostrum.

References: Webber, W.R.; Fenaughty, C.M.; Clark, M.R. (1990). A guide to some common offshore shrimp and prawn species of New Zealand. *New Zealand Fisheries Occasional Publication* 6. 42 p.

Richardson, L.R.; Yaldwyn, J.C. (1958). A guide to the natant decapod crustacea (shrimps and prawns) of New Zealand. *Tuatara* 7: 17–41.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Nephropidae

***Metanephrops challengeri* (Scampi) (SCI)**



Distinguishing features: Lobster-like, with prominent, slightly uprising rostral horn, and a pair of elongate pincers. Large eyes. Distinctive and spectacular colour: predominantly fawn or reddish brown, with bands of crimson.

Colour: Upper surfaces fawn or reddish brown; lateral surfaces white; carpus of chelipeds conspicuously crimson, with transverse bands of crimson across posterior margin of carapace and posterior margins of tail segments.

Size: Total length up to 25 cm. More commonly to 18 cm.

Distribution: Widespread in New Zealand waters in mud substrates, but most abundant off the east coast of the North Island, the Chatham Rise, off the northwest of the South Island, on the Challenger Plateau, and east and south of Auckland Island.

Depth: 140 to 640 m. Most common 200 to 500 m.

Similar species: None in New Zealand waters, but resembles European scampi, *Nephrops norvegicus*.

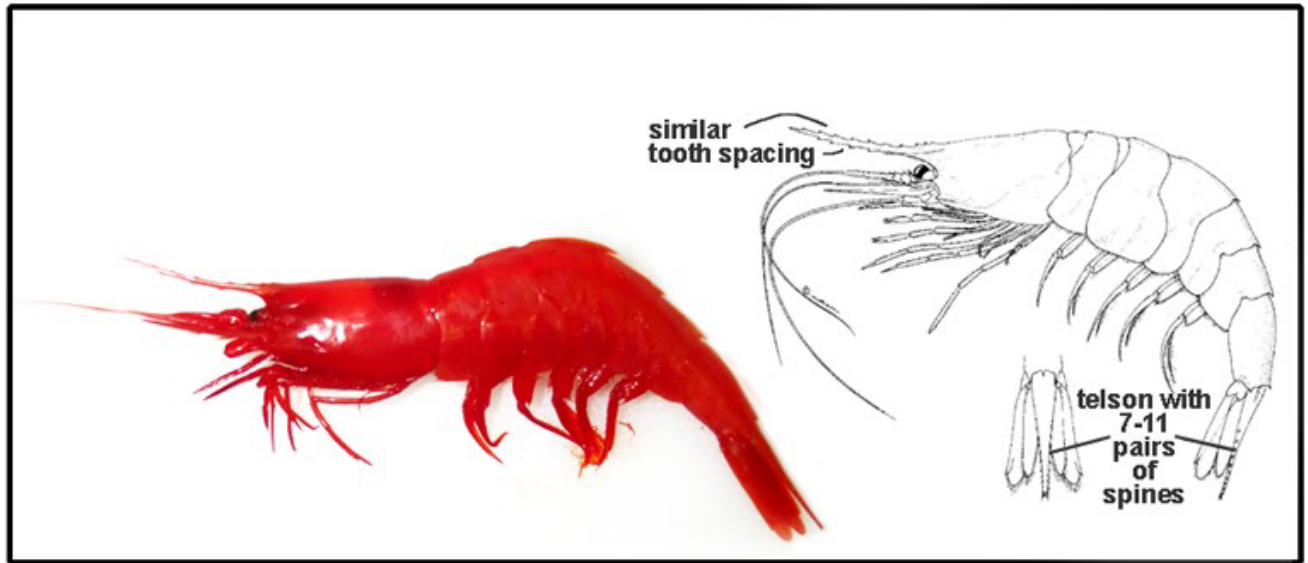
References: Holthuis, L.B. (1991). Marine lobsters of the world. *FAO Species Catalogue 13*. 292 p.

O'Driscoll, R.L. et al. (2003). Areas of importance for spawning, pupping or egg-laying, and juveniles of New Zealand deepwater fish, pelagic fish, and invertebrates. *NIWA Technical Report 119*. 377 p.

Webber, W.R. (2002). All the pretty lobsters III. *Seafood New Zealand 10*(2): 48–52.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Oplophoridae

***AcanthePHYra* spp. (Subantarctic ruby prawn) (ACA)**



Distinguishing features: Few species are as uniformly bright red as *AcanthePHYra*. Telson with 4 pairs of spines (*A. quadrispinosa* (AQU)) or 7–11 pairs (*A. pelagica* (APE)). Spacing of teeth on the rostrum is similar on both top and bottom.

Colour: Uniformly bright red to scarlet.

Size: Total length up to 140 mm.

Distribution: Both species have been reported in all but the southern most parts of the New Zealand EEZ, with *AcanthePHYra quadrispinosa* more commonly found in the north (north of Cook Strait) and *A. pelagica* in the south (Challenger Plateau and Chatham Rise down to 50° S on the Campbell Plateau).

Depth: 400 to 2000 m. Most commonly recorded around 1000 m.

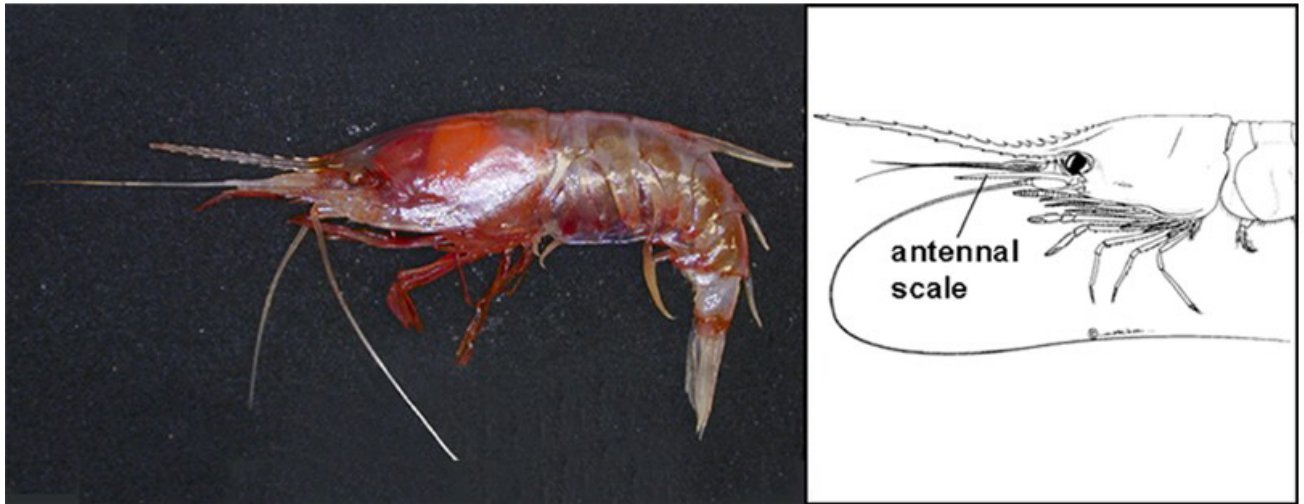
Similar species: There are three other species of *AcanthePHYra* found in New Zealand waters, but they are infrequently caught. *Systellaspis debilis* is similar in shape, but body colour is partly red, partly translucent, or colourless; and lower parts of the carapace have a line of photophores.

References: Webber, W.R. (2002). Prawns coming in from the cold (Pt 1). *Seafood New Zealand* 10(9): 75–78.

Webber, W.R.; Fenaughty, C.M.; Clark, M.R. (1990). A guide to some common offshore shrimp and prawn species of New Zealand. *New Zealand Fisheries Occasional Publication* 6. 42 p.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Oplophoridae

***Oplophorus* spp. (Deepwater prawns) (ONO)**



Distinguishing features: Solid body, prominent and long spines on abdominal segments 3 to 5. *O. novaezeelandiae* has a smooth outer edge to the antennal scale, but there are small spines on that of *O. spinosus*.

Colour: Anterior half of body red, abdomen red-striped, rostrum and large spines transparent.

Size: Total length up to 100 mm (total length measurement includes rostrum).

Distribution: Widespread through the South Atlantic and southern Pacific Oceans, western Australia, and New Zealand. Around New Zealand, *Oplophorus novaezeelandiae* is recorded from the Kermadec Ridge to the southern margin of the Campbell Plateau. *O. spinosus* has a more northern distribution than *O. novaezeelandiae*, with the latter dominating south of East Cape.

Depth: 200 to 1100 m. Mainly taken 800–950 m. Has also been recorded at or near surface.

Similar species: None. The abdominal spines are very distinctive.

References: Webber, W.R.; Fenaughty, C.M.; Clark, M.R. (1990). A guide to some common offshore shrimp and prawn species of New Zealand. *New Zealand Fisheries Occasional Publication* 6. 42 p.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Palinuridae

***Projasus parkeri* (Deepwater rock lobster) (PPA)**



Distinguishing features: Prominent supraorbital horns with row of 2 spines behind each. A single median spine followed by 2 submedian rows of 8 spines. Low median carina on first 5 segments of abdomen; 6th segment with 2 pairs of submedian spines and others on posterior margin.

Colour: Light orange to straw brown.

Size: Carapace length up to 92 mm. Specimens available mainly 70–90 mm CL.

Distribution: Challenger Plateau, Bay of Plenty to Castlepoint, Chatham Rise, Louisville Ridge.

Depth: 480 to 970 m. Species has been taken as shallow as 330 m in other parts of the world.

Similar species: Rock lobsters with such carapace spination are unique in New Zealand waters.

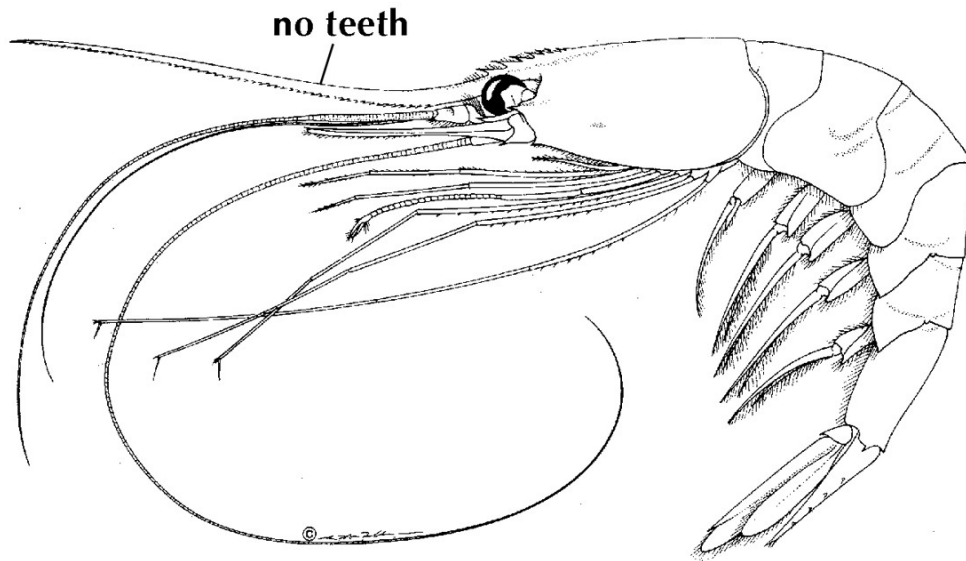
References: Booth, J.; Webber, R. (2001). All the pretty lobsters. I. *Seafood New Zealand* 9(11): 20–23.

Holthuis, L.B. (1991). Marine lobsters of the world. *FAO Fisheries Synopsis* 125.

Webber, W.R.; Booth, J.D. (1988). *Projasus parkeri* (Stebbing, 1902) in New Zealand and description of a *Projasus* puerulus from Australia. *National Museum of New Zealand Records* 3: 81–92.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Pandalidae

***Plesionika martia* (Golden prawn) (PLM)**



Distinguishing features: The bottom of the rostrum has many small and close-set teeth right out to the tip; teeth are absent from the top of the rostrum except above the eye; females with ming-blue eggs.

Colour: Most of body translucent to light pink, tip of rostrum red, small red areas on abdomen and telson.

Size: Total length up to 170 mm (including long rostrum).

Distribution: Widely distributed; around New Zealand found from the Kermadec Islands to Cook Strait, with records predominantly from the Bay of Plenty and Challenger Plateau.

Depth: 180 to 2100 m. Most commonly caught from 400 to 600 m.

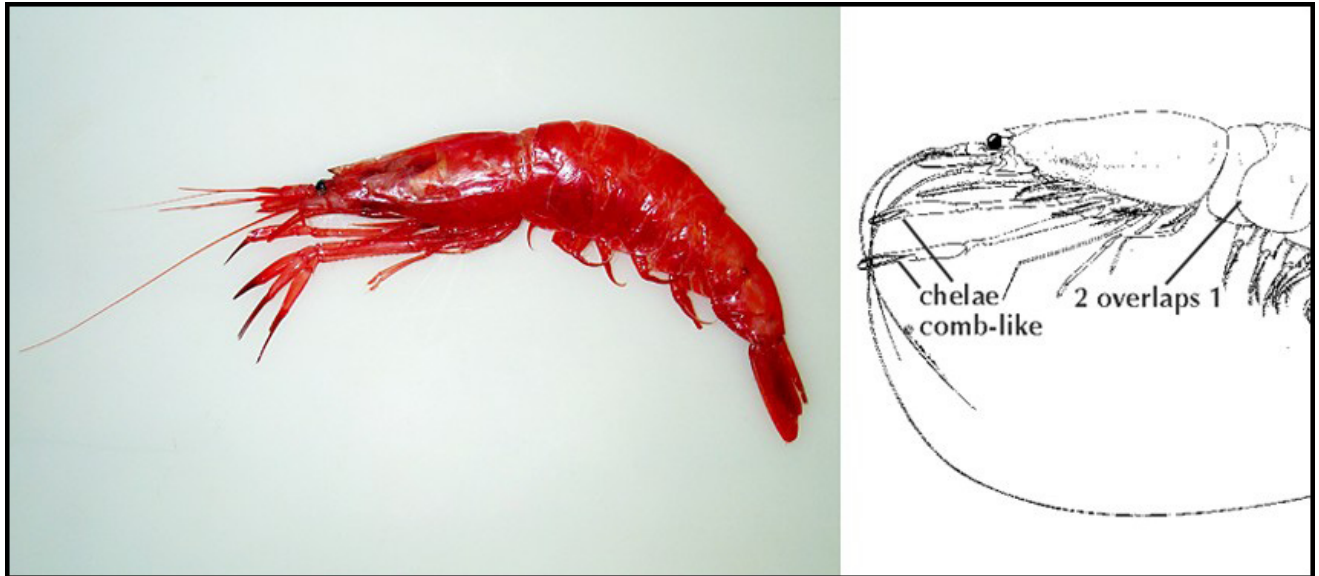
Similar species: *Notopandalus magnoculus*, teeth on bottom of rostrum are spaced out more towards the tip; teeth above the eye are slender and moveable. *Lipkius holthuisi*, teeth on bottom of rostrum also spaced out more towards the tip. *Nematocarcinus* spp. teeth occur on the top of the rostrum, out to the tip.

References: Webber, W.R.; Fenaughty, C.M.; Clark, M.R. (1990). A guide to some common offshore shrimp and prawn species of New Zealand. *New Zealand Fisheries Occasional Publication 6*: 42 p.

Webber, W.R. (2002). Prawns coming in from the cold (Pt 2). *Seafood New Zealand 10(10)*: 70–71.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Pasiphaeidae

***Pasiphaea aff. tarda* (Deepwater prawn) (PBA)**



Distinguishing features: A large, noticeably flat-sided prawn with a very small rostrum (largest of the genus *Pasiphaea* in New Zealand). Long fine chelae (pincers) on legs 1 & 2, cutting edges of pincers with comb-like rows of fine teeth. Abdominal segment 2 overlaps segment 1.

Colour: Red.

Size: Total length up to 160 mm (includes rostrum).

Distribution: *Pasiphaea aff. tarda* is commonly caught in trawls on the Chatham Rise, Challenger Plateau, and around the South Island. Also recorded off East Cape and in Bay of Plenty, but generally has a more southern distribution.

Depth: 750 to 1500 m. Most commonly reported from 800 to 1200 m.

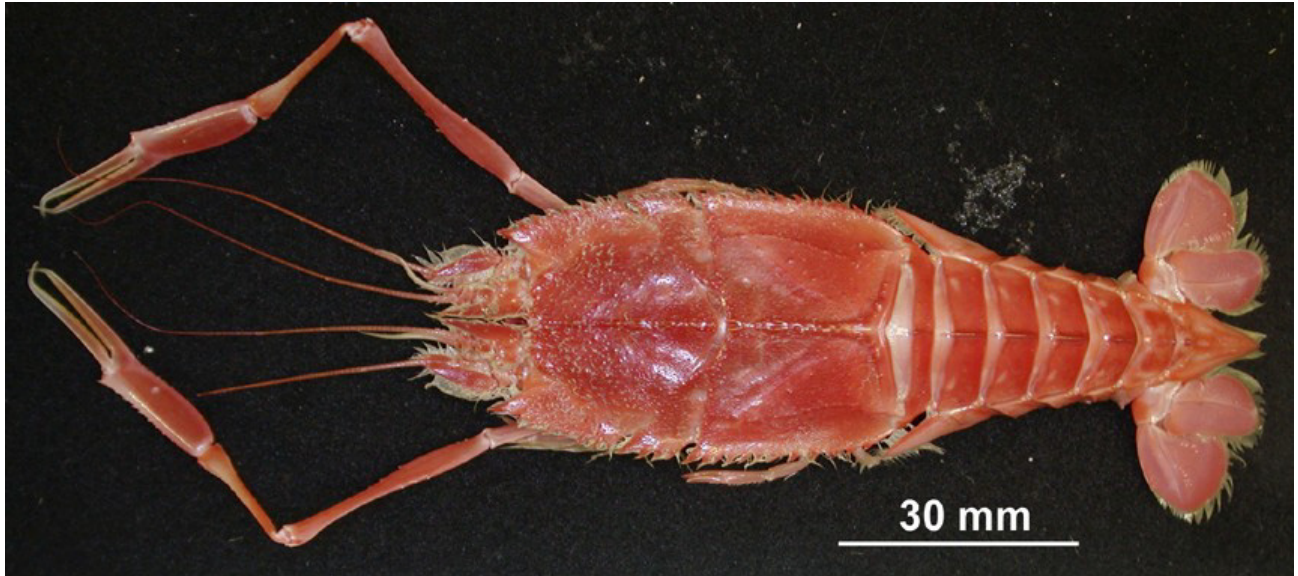
Similar species: Small specimens of *Pasiphaea aff. tarda* very hard to distinguish by eye from other species of the genus. Any large animal (longer than 100 mm) is almost certainly *P. aff. tarda*. *Sergia potens* has abdominal segment 1 overlapping segment 2, and chelae on legs 2 and 3 which are very small.

References: Webber, W.R.; Fenaughty, C.M.; Clark, M.R. (1990). A guide to some common offshore shrimp and prawn species of New Zealand. *New Zealand Fisheries Occasional Publication* 6. 42 p.

Webber, W.R. (2002). Prawns coming in from the cold (Pt 2). *Seafood New Zealand* 10(10): 70–71.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Polychelidae

***Polycheles suhmi* (Deepsea blind lobster) (PSU)**



Distinguishing features: Lobster-like, but first 4 pairs of legs (all in females) with pincers – long and slender on the first pair and small and short on the rest. Elongate, flat-topped cephalothorax, bordered with sharp spines. Small rostrum of 2 spines. Eyes represented by pigment-free points at the front.

Colour: Generally pink with the carapace spines and abdominal terga a darker rose pink.

Size: Carapace length up to 40 mm. Most often about 30 mm CL.

Distribution: Widespread in New Zealand waters, at least from Bay of Plenty to Auckland Islands.

Depth: 290 to 2200 m.

Similar species: *P. suhmi* is distinguished from its congeners in having a cluster of 6 spinules posteriorly on the gastric region, bicuspid median carinae on abdominal tergites 5, and the posterior cusp more prominent on tergites 4 and 5 (Galil 2000).

References: Bate, C.S. (1888). Report on the scientific results of the voyage of HMS Challenger during the years 1873–76. *Zoology* 24: 1–942.

Dawson, E.W. (1997). The deep-sea 'blind' lobsters – a species list and bibliographic index. *Occasional Papers of the Hutton Foundation* 8.

Galil, B.S. (2000). Crustacea Decapoda: review of the genera and species of family Polychelidae. *Memoires du Museum National d'Histoire Naturelle* 184: 285–387.

Griffin, D.J.G.; Stoddart, H.E. (1995). Deep-water crustacea from eastern Australia. *Records of the Australian Museum* 47: 231–263.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Scyllaridae

***Ibacus alticrenatus* (Prawn killer) (PRK)**



Distinguishing features: Dorso-ventrally flattened. Second antenna modified to a closely hinged series of 5 flat plates. Carapace covered by velvety pubescence.

Colour: Dorsal surface of carapace and antennae red-orange to brown, with darker red spots in the middle of the carapace. Lateral carapace spines and pleural spines tipped with yellow brown. 6th abdominal segment and uropods and telson yellow-brown.

Size: Carapace length up to 63 mm. More commonly less than 50 mm.

Distribution: North Island, northern South Island as far south as Oamaru, and Chatham Islands. Possibly at Kermadec Islands and on Campbell Plateau and Chatham Rise.

Depth: 20 to 700 m. Possibly deeper too, but mostly on shelf and upper slope.

Similar species: *Ibacus brucei* more flattened, and appears to lack hair on the carapace. Outer margin of distal antennal lamellae of *Arctides antipodarum* has numerous insignificant teeth.

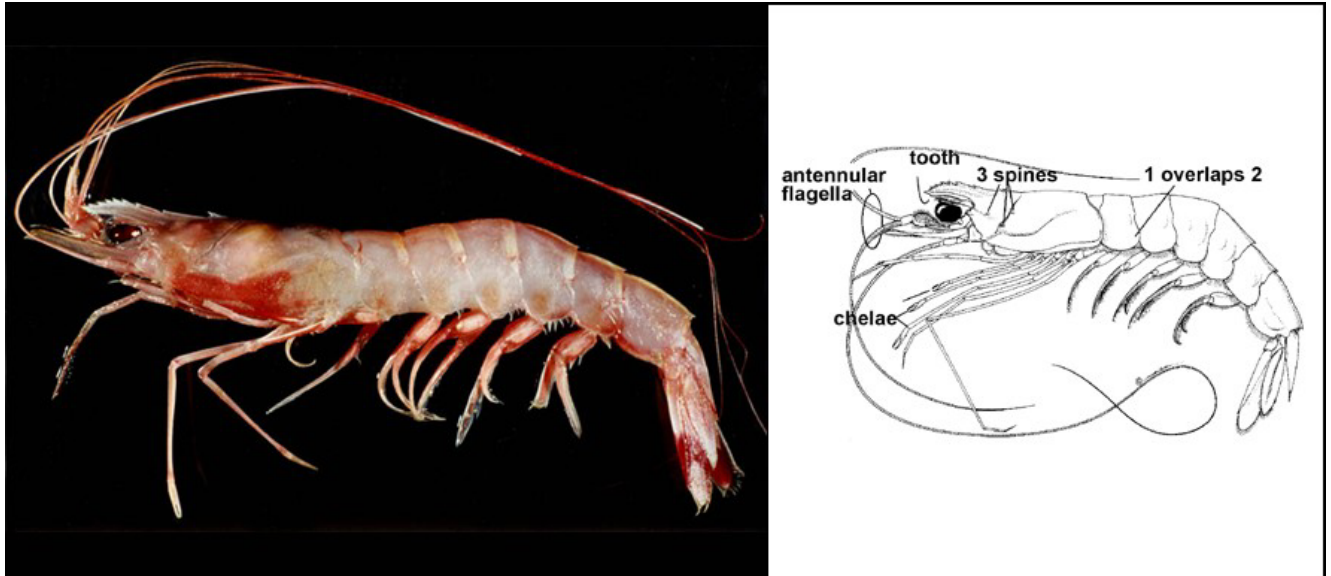
References: Dell, R.K. (1955). A record of *Latreillopsis petterdi* Grant from New Zealand, with notes on some other species of Crustacea. *Records of the Dominion Museum* 2: 147–149.

Holthuis, L.B. (1985). A revision of the Family Scyllaridae 1. Subfamily Ibacinae. *Zoologische Verhandelingen* 218 p.

O'Driscoll, R.L. et al. (2003). Areas of importance for spawning, pupping or egg-laying, and juveniles of New Zealand deepwater fish, pelagic fish, and invertebrates. *NIWA Technical Report 119*. 377 p.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Solenoceridae

Haliporoides sibogae (Jack-knife prawn) (HSI)



Distinguishing features: A single small tooth below the rostrum tip; rostrum arched dorsally; rostrum longer than eye; 3 small spines on side of carapace; antennular flagella round (not flat); first abdominal segment overlaps second; legs 1–3 have small chelae (pincers).

Colour: Red-pink, with colourless to yellow-orange areas on abdomen.

Size: Total length up to 200 mm.

Distribution: Widely distributed. Around New Zealand, distributed primarily between North Cape and the Chatham Rise, with a few occurrences on the Campbell Plateau.

Depth: 100 to 1500 m. A wide range of depths, most frequently recorded from 350 to 600 m.

Similar species: *Solenocera comata* has no tooth below the rostral tip, rostrum is shorter than eye, 2 (not 3) spines on side of carapace, flattened antennular flagella. *Funchalia* spp. are hairy on the body, no tooth below rostrum tip. *Chlorotocus novaezelandiae*: abdominal segment 2 overlaps segment 1, and only leg 2 has chelae.

References: Webber, W.R.; Fenaughty, C.M.; Clark, M.R. (1990). A guide to some common offshore shrimp and prawn species of New Zealand. *New Zealand Fisheries Occasional Publication* 6. 42 p.

Grey, D.L.; Dall, W.; Baker, A. (1983). A guide to the Australian penaeid prawns. Department of Primary Production of the Northern Territory, Australia. 140 p.

Phylum Arthropoda
Class Malacostraca
Order Isopoda (Sea lice)
Family Aegidae

***Aega monophthalma* (Fish biter) (AMO)**



Distinguishing features: Huge eyes that meet in the middle. Antennule flattened. Body heavily pitted on the posterior segments. Mouthparts form a conical bundle under the head.

Colour: Pale yellow to brown, orange laterally, white below; eyes dark brown to black.

Size: Total length from 40 to 63 mm. Size range is for adults; females are larger than males.

Distribution: Widespread in the Atlantic, southwestern Pacific and Southern Ocean; also eastern Australia.

Depth: 440 to 930 m.

Similar species: Several other similar species including *Aega semicarinata*. Other species have separate eyes or a smooth body surface.

References: Bruce, N. L. (2002). Parasites or predators? New Zealand's aegid isopod crustaceans. *Biodiversity Update* 5: 8.

Bruce, N.L.; Lew Ton, H.M. ; Poore, G.C.B. (2002). Aegidae White, 1850. p. 159–163. *In*, Poore, G.C.B. (ed.) Crustacea: Malacostraca: Syncarida and Peracarida: Isopoda, Tanaidacea, Mictacea, Thermosbaenacea, Spelaeogriphacea. Melbourne. CSIRO Publishing. 433 p.

Phylum Arthropoda
Class Malacostraca
Order Isopoda
Family Serolidae

***Acutiserolis* sp. (Spiny serolid isopod) (ACU)**



Distinguishing features: Body strongly flattened, lateral margins with conspicuous spines; eyes dorsal.

Colour: Varying from translucent, slate grey, or brown; eyes may be copper, brown, black, or bright pink.

Size: Total length from 10 to 40 mm.

Distribution: *Acutiserolis* species are found throughout the New Zealand EEZ, from the continental shelf to depths of about 3000 m.

Depth: 100 to 3000 m.

Similar species: The genus has 8–12 species in New Zealand waters, none of which appear to have been named. Other serolid genera are similarly flattened, but lack the lateral spines and some are without eyes.

References: Poore, G.C.B.; Brandt, A. (1997). Crustacea Isopoda Serolidae: *Acutiserolis cidaris* and *Caecoserolis novaecaledoniae*, two new species from the Coral Sea. Résultats de Campagnes MUSORSTOM, Vol. 18. *Mémoires du Muséum National d'Histoire Naturelle, Paris 176*: 151–168.

Phylum Arthropoda
Class Crustacea
Order Lophogastrida
Family Gnathophausiidae

***Neognathophausia ingens* (Giant red mysid) (GNA)**



Distinguishing features: These mysids are prawn-like, fragile and soft, deep to bright scarlet. Rostrum elongate (triangular in cross section). Antenna 2 scale, outer margin serrated and without setae. Uropod exopod with distal articulation.

Colour: Bright scarlet.

Size: Total length up to 300 mm. More commonly much smaller – 30 mm.

Distribution: Widespread in tropical and temperate seas.

Depth: 50 to 900 m. Migrate vertically in water column diurnally, so depths given are depth in water, not bottom depths.

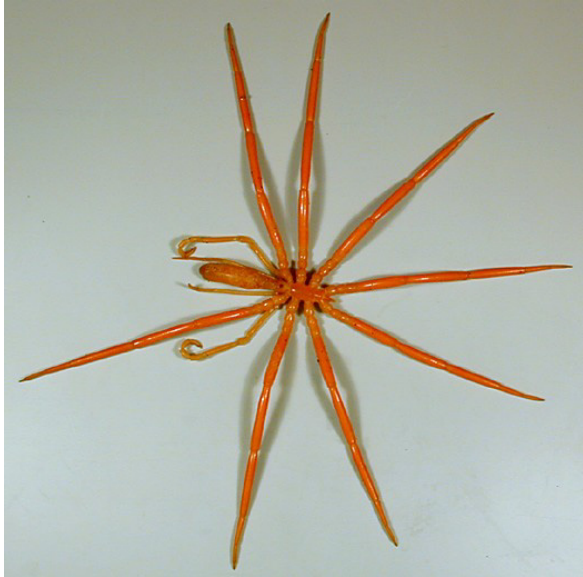
Similar species: Mysids are distinguished from shrimps, prawns, and krill in that the carapace is not attached to the last few segments at the posterior end and so can be lifted.

References: Lowry, J.K.; Stoddart, H.E. (2003). Crustacea: Malacostraca: Peracarida: Amphipoda, Cumacea, Mysidacea. *Zoological Catalogue of Australia* 19.2B.

Webber, R. (2002). Prawns coming in from the cold. *Seafood New Zealand* 10(9): 75–78.

Phylum Arthropoda
Class Pycnogonida
Order Pantopoda
Family Colossendeidae

***Colossendeis* spp. (Giant sea spiders) (PYC)**



Distinguishing features: Eight legs or more, spider-like, large bodied, eyes usually completely lacking.

Colour: Most dull white or brown, but some bright reddish orange.

Size: From 1 to 6 cm. Measurement is body length.

Distribution: Cosmopolitan deepsea genus often found in quite shallow Antarctic waters.

Depth: 5 to 1000 m.

Similar species: Other members of Family Colossendeidae.

References: Allan-Child, C. (1998). The marine fauna of New Zealand: Pycnogonida (sea spiders). *NIWA Biodiversity Memoir 109*. 71 p.

Fry, W.G.; Hedgpeth, J.L. (1969). The fauna of the Ross Sea. Part 7. Pycnogonida, 1. *New Zealand Oceanographic Institute Memoir 49*. 139 p.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Galatheidae

***Munida* spp. (Krill, squat lobsters) (MNI)**



Distinguishing features: Shrimp-like, chelipeds greatly elongate and slender, abdomen folded up against itself. Telson (middle appendage of tail) without transverse suture (junction).

Colour: Red to brown. Also orange, pink, sometimes striped.

Size: Carapace length up to 50 mm. Size varies between species.

Distribution: Worldwide.

Depth: 0 to 2000 m.

Similar species: Chirostylids and other galatheid species.

References: O'Shea, S.; McKnight, D.; Clark, M. (1999). Bycatch – the common, unique and bizarre. *Seafood New Zealand* 7(5): 45–51.

Poore, G.C.B. (2004). Marine decapod Crustacea of Southern Australia: a guide to identification. CSIRO Publishing. 574 p.

Phylum Arthropoda
Class Crustacea
Order Decapoda
Family Chirostylidae

***Uroptychus* spp. (Squat lobsters) (URP)**



Distinguishing features: Shrimp-like, chelipeds greatly elongate and slender, abdomen folded up against itself. Telson (middle appendage of tail) with a transverse suture (junction).

Colour: Light pink to red.

Size: Carapace length up to 45 mm. Size varies between species.

Distribution: Worldwide.

Depth: 100 to 5000 m.

Similar species: Galatheids and other chirostylids.

References: O'Shea, S.; McKnight, D.; Clark, M. (1999). Bycatch - the common, unique and bizarre. *Seafood New Zealand* 7(5): 45-51.

Poore, G.C.B. (2004). Marine decapod Crustacea of Southern Australia: a guide to identification. CSIRO Publishing. 574 p.

Phylum Arthropoda
Class Crustacea
Order Thoracica
Family Scalpellidae

***Smilium zancleanum* (Acorn barnacle) (BRN)**



Distinguishing features: Large barnacle with 13 white calcereous plates which make up the capitulum and are separated by brown chitinous material.

Colour: Chocolate to dark straw-coloured stalk with fine white spines.

Size: Total length from 1 to 130 mm.

Distribution: Worldwide. Occurs on the flat slope and on seamounts.

Depth: 120 to 1100 m.

Similar species: Other scalpellid barnacles.

References: Buckeridge, J. (1999). Barnacles, not just a fouling nuisance. *Seafood New Zealand* 7(2): 38–39.

Foster, B.A. (1978). The marine fauna of New Zealand: barnacles (Cirripedia: Thoracica). *New Zealand Oceanographic Institute Memoir* 69. 160 p.

PHYLUM

Echinodermata

Sea stars, brittle stars, sea urchins,
sea cucumbers, feather stars and sea lillies

Phylum

ECHINODERMATA

Sea-stars, brittle stars, sea urchins,
sea cucumbers, feather stars and sea lilies

The **Echinodermata** is a group of animals with spiny skins and tube-feet, showing a great variety of shapes and sizes; members of the commoner classes are generally recognisable as starfish or sea-stars, brittle stars, or sea urchins. Less well known are the feather stars, sea lilies, and sea cucumbers. All common extant forms have a basic pentaradial symmetry with tube-feet present, and an endoskeleton of calcitic plates or ossicles, these ranging from microscopic to conspicuous. Echinoderms have an extensive fossil history, but only five classes are likely to be collected in commercial trawling operations.

Asteroids (sea stars or starfish) are among the most familiar echinoderms. The central disc merges with the arms, and on the underside the tube-feet are placed in a groove. Extensions of the gut extend into the arms, and in a few species the gonads may similarly extend or are limited to the arms. Sea stars show a great variety of shapes, from pentagonal to those with elongate arms and a small disc. There are usually five arms but several species have more. The more unusual types occur in the order Brisingida, where the disc is small and the deciduous arms appear distinct from the disc.

Ophiuroids (brittle stars) differ from sea stars in lacking the distinct groove on the underside of the arms, with the tube-feet piercing the ventral arm plates. The arms are distinctly separated from the disc. Most species have only five arms, though a few have six or more. Brittle-stars are generally small and fragile, and the arms are often broken when captured. Most brittle-stars (Order Ophiurida) have arms usually coiling horizontally (though in some they coil vertically) and the armspines are placed on the sides of the arms, either erect or pressed against the side. Brittle-stars of the order Euryalinida, known as basket-stars or snake-stars, differ from the typical forms in having arms coiling vertically, with the armspines pointing downward; the larger basket-stars have the arms branching, usually from close to the edge of the disc, while the snake-stars have simple arms.

Echinoids (sea urchins or sea eggs) lack arms, and have a variety of forms. The commoner type is spherical or globose, but discoidal or heart-shaped forms also occur. The body or test is composed of distinct plates, in 20 columns, 10 of which are pierced by the tube-feet. Conspicuous spines, sometimes modified, are present, and in the spherical and discoidal species a complex jaw apparatus (Aristotle's lantern) is present on the underside; this is absent in the heart-shaped species.

Holothurians (sea cucumbers) generally have a soft, usually cylindrical, body with microscopic plates or ossicles embedded in the body wall, though a few species are more or less rigid, with small overlapping plates present. Five rows of tube-feet are usually present, though they are absent in one order. Although most species are small to medium in size, some tropical and deepsea species can be quite large. Identification of species usually requires laboratory examination of the ossicles embedded in the skin.

Crinoids are stalked (sea lilies) or unstalked (feather stars) with a small cup-like body, or calyx, composed of plates in cycles of five. This body is roofed by a membrane that may have immersed plates; moveable arms, usually branched, extend from the margin of the calyx, and

are made up of small subcircular plates united by muscles. The arms contain extensions of the viscera, gonads, nerves, and water vascular systems. The tube-feet are inconspicuous, and extend to the arm tips. Sea lilies have a stem made up of discoidal plates, and attach to the seafloor by terminal roots, or a flattened basal piece; others have thin-jointed cirri along the stem, each with a terminal hook, to enable temporary attachment.

Feather stars have the stem reduced to a plate at the base of the calyx, to which the cirri are attached.

Crinoids are generally fragile, and often only fragments are found in samples. Entire specimens will often fragment when exposed on deck.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Forcipulatida
Family Asteriidae

***Cosmasterias dyscrita* (Cat's-foot star) (CDY)**



Distinguishing features: Disc small with 5 long rounded arms. Marginal plates inconspicuous. Plates of upper surface in fairly regular longitudinal rows, generally wider than long, and each with 2 to 4 short, blunt spines. Pedicellariae scattered over surface of body. Tube-feet with sucking-discs, in 4 rows. Often the arms break from the disc.

Colour: Light brown when preserved.

Size: Total width up to 260 mm.

Distribution: Widespread throughout the New Zealand region and also present in Australia.

Depth: 50 to 1200 m.

Similar species: *Pseudichinaster rubens*, which has a mainly transverse arrangement of the plates on the upper surface.

References: McKnight, D.G. (in press). The marine fauna of New Zealand. Echinodermata: Asteroidea (sea-stars). Orders Velatida, Spinulosida, Forcipulatida and Brisingida. *NIWA Biodiversity Memoir*.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Forcipulatida
Family Asteriidae

***Sclerasterias mollis* (Cross-fish) (SMO)**



Distinguishing features: Disc small, with 5 rounded or 5-sided arms; plates of upper surface in longitudinal rows, most with one spine, with a wreath of tiny pedicellariae (jaw-like appendages) around the base which may appear as a gelatinous sheath. Marginal plates inconspicuous. Tube feet in 4 rows, each with a distinct sucking-disc.

Colour: Orange to brick-red, arms with spines in 5 rows of whitish, cream, or yellow.

Size: Total width up to 400 mm.

Distribution: Widespread throughout the New Zealand region, from the Kermadec Islands to the Auckland Islands, including the Chatham Islands; common south of Cook Strait.

Depth: 0 to 660 m.

Similar species: The wreaths around the spines of the upper surface differentiate this species from *Cosmasterias* and *Pseudechinaster*. Two rarer species in genera *Perissasterias* and *Taranuiaster* lack the orange mottling. One other species, apparently new to New Zealand, is known only from active submarine volcanoes north of the Bay of Plenty. It differs in being uniformly very dark red to almost black.

References: McKnight, D.G. (in press). The marine fauna of New Zealand. Echinodermata: Asteroidea (sea-stars). Orders Velatida, Spinulosida, Forcipulatida and Brisingida. *NIWA Biodiversity Memoir*.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Paxillosida
Family Astropectinidae

***Dipsacaster magnificus* (Magnificent sea-star) (DMG)**



Distinguishing features: Large, with large, 5-armed flat disc. Arms broad at the base, tapering rapidly and evenly to a sharp tip. Plates of upper surface with clusters of short spinelets. Madreporite large, obscured by spinelets in a slightly depressed area near the marginal plates. Lower marginal plates project beyond upper plates to form a very distinct edge to disc and arms; both series of marginal plates bearing spinelets. Tube-feet pointed, in 2 rows.

Colour: Usually orange, but also recorded as light dirty grey with patches of yellow and salmon pink above, cream below.

Size: Total width up to 360 mm.

Distribution: Widespread around New Zealand, from Lord Howe Rise in the north to Campbell Plateau in the south, including the Chatham Rise and Louisville Ridge. Also widespread in Australian waters.

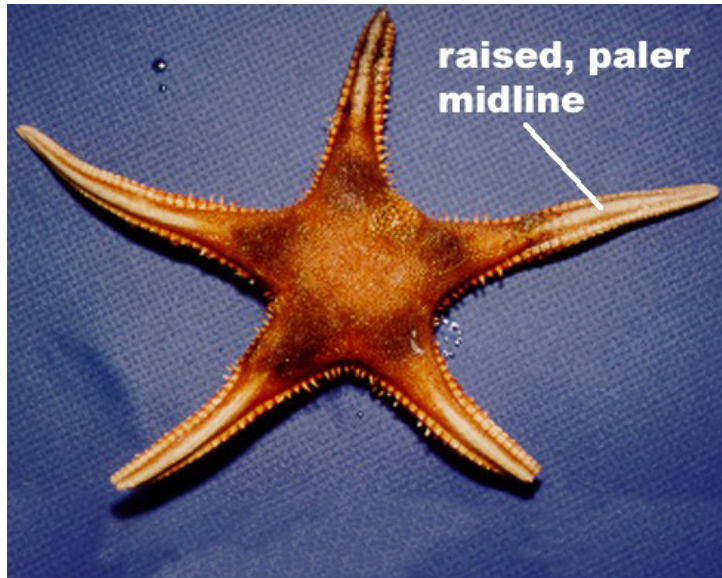
Depth: 100 to 1100 m.

Similar species: The only member of this genus found in New Zealand, *D. magnificus* is broadly similar to species of *Plutonaster*, *Proserpinaster*, and *Psilaster*, although these generally have much narrower arms.

References: Clark, H.E.S.; McKnight, D.G. (2000). The marine fauna of New Zealand: Echinodermata: Asteroidea (sea-stars). Orders Paxillosida and Notomyotida. *NIWA Biodiversity Memoir 116*: pp 57–61.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Paxillosida
Family Astropectinidae

Plutonaster knoxi (Abyssal star) (PLT)



Distinguishing features: Disc large and flat, or slightly raised centrally and along midline of the 5, long, slender, arms. Plates of upper surface with short spines. Marginal plates separated by grooves lined with small spinelets, plates covered with granules, and usually each with an erect spine. Madreporite very large, intricately patterned, and covered by bushy clumps of spines. Tube-feet pointed, in 2 rows.

Colour: Generally orange, orange/red, with pale yellow. Often a paler orange/yellow stripe along midline of arms.

Size: Total width up to 260 mm.

Distribution: Widespread around the New Zealand region, especially common on the Chatham Rise.

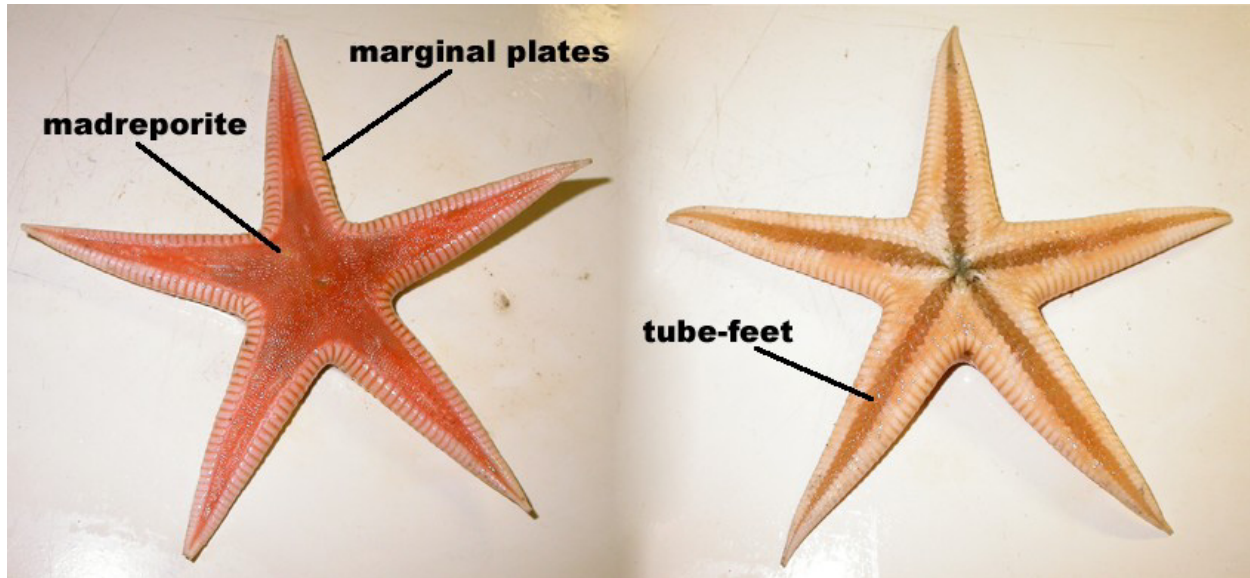
Depth: 500 to 2000 m.

Similar species: Seven species of *Plutonaster* are recorded from the New Zealand region, but *P. knoxi* is the most common; it also could be confused with *Dipsacaster*, *Psilaster*, and *Proserpinaster*.

References: Clark, H.E.S.; McKnight, D.G. (2000). The marine fauna of New Zealand: Echinodermata: Asteroidea (sea-stars). Orders Paxillosida and Notomyotida. *NIWA Biodiversity Memoir 116*: 82–87.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Paxillosida
Family Astropectinidae

***Psilaster acuminatus* (Geometric star) (PSI)**



Distinguishing features: Outline strongly star-shaped; disc and 5 arms flat although slightly raised near arm bases and slightly depressed centrally. Conspicuous madreporite located between arms and nearer to marginal plates than disc centre. Plates of upper surface with short spines. Marginal plates conspicuous, those of the upper series slightly raised and separated from each other by deep grooves, forming a distinct edge to the disc and arms. Lower marginal plates with short spines. Tube-feet pointed, in 2 rows.

Colour: Usually uniformly orange above, with much paler marginal plates. Upper surface also described as dark-pink, orange-pink, and bright-salmon. Creamy yellow below with delicate pink tube-feet.

Size: Total width from 10 to 240 mm.

Distribution: Very common in the New Zealand region, from Lord Howe Island in the north to Campbell Island in the south, including the Chatham Islands, but no records from Foveaux Strait or Stewart Island. Also known from Australia and South Africa.

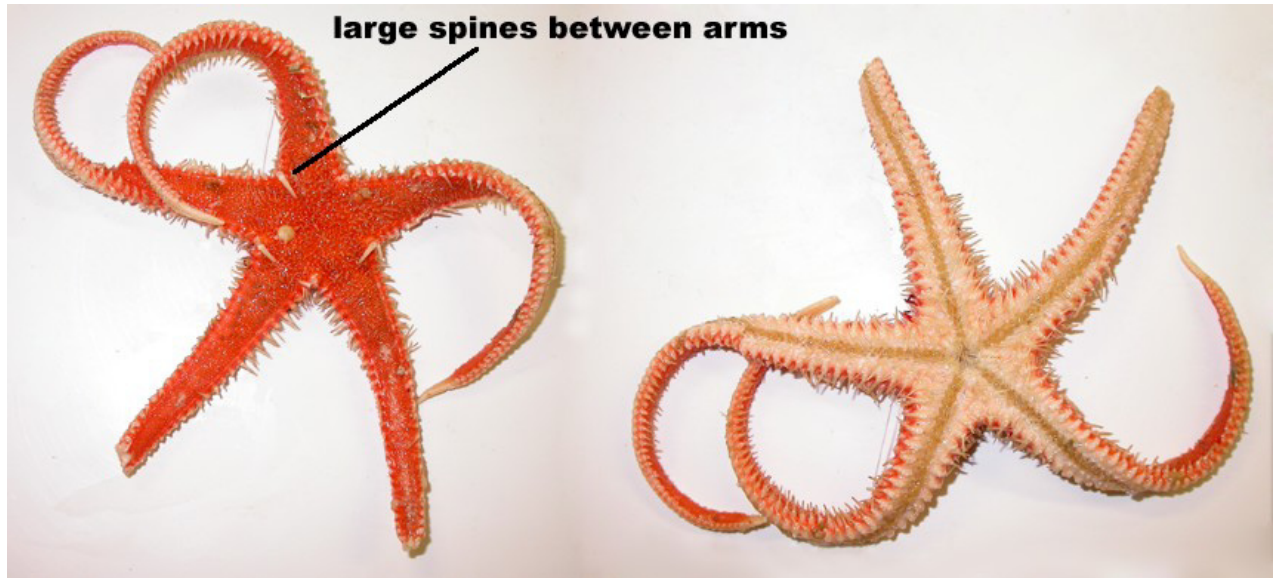
Depth: 30 to 2500 m. Most common from 200 to 600 m.

Similar species: Could be confused with species of *Plutonaster*, *Dipsacaster*, and *Proserpinaster*, but can be distinguished by its distinctive marginal plates.

References: Clark, H.E.S.; McKnight, D.G. (2000). The marine fauna of New Zealand: Echinodermata: Asteroidea (sea-stars). Orders Paxillosida and Notomyotida. *NIWA Biodiversity Memoir 116*: 99–104.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Notomyotida
Family Benthopectinidae

***Benthopecten pikei* (Five-spined star) (BPI)**



Distinguishing features: Disc small, 5 long arms, gently tapering and often curling upward after capture; lower and upper surfaces flat. Conspicuous spines (up to 8 mm) along marginal plates, especially at interradius, where a large upwardly directed spine is present on the unpaired upper marginal plate. The 2 series of marginal plates tend to alternate in position.

Colour: Bright orange above and along margins, cream below.

Size: Total width up to 300 mm.

Distribution: Widespread on the continental slope, from the Lord Howe Rise, Chatham Rise, Campbell Plateau, and Bounty Platform.

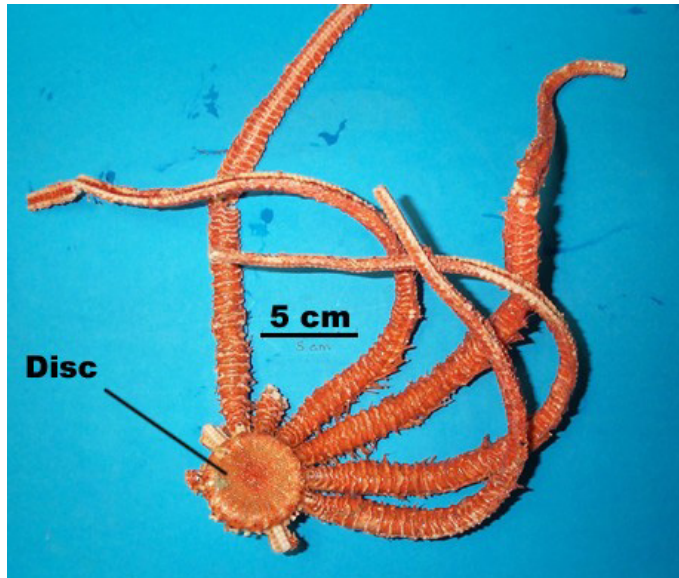
Depth: 330 to 1820 m.

Similar species: *Benthopecten munidae* (scarlet coloured) differs only slightly, and *B. pentacanthus* is known only from a single, juvenile, specimen.

References: Clark, H.E.S.; McKnight, D.G. (2000). The marine fauna of New Zealand: Echinodermata: Asteroidea (sea-stars); Order Paxillosida by H.E.S. Clark and D.G. McKnight; Order Notomyotida by D.G. McKnight: *NIWA Biodiversity Memoir 116: 140–143*.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Brisingida
Family Brisingidae, Hymenodiscidae, Novodiniidae, Freyellidae

(Armless stars) (BRG)



Distinguishing features: About 12 species are recorded for this order. All have at least 6 arms, usually over 10, with a small, rounded disc. The arms are long, often higher than wide, and are quite deciduous and often all that is taken. Arms constructed from tiny plates immersed in skin, and transverse rows of plates the largest of which, at the ventro-lateral margin, bearing one or more long spines. All spines have a thick coating of skin. Tube feet in 2 rows, with sucking-discs.

Colour: Various.

Size: Total width up to 260 mm.

Distribution: Throughout New Zealand.

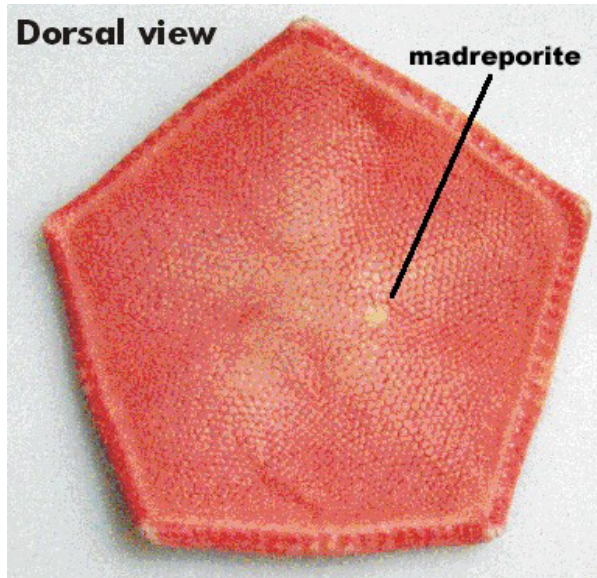
Depth: 150 to 6000 m.

Similar species: None. Pictured is *Brisinga chathamica*.

References: McKnight, D.G. (in press). The marine fauna of New Zealand. Echinodermata: Asteroidea (sea-stars). Orders Velatida, Spinulosida, Forcipulatida and Brisingida. *NIWA Biodiversity Memoir*.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Valvatida
Family Goniasteridae

Ceramaster patagonicus patagonicus (Pentagon star) (CPA)



Distinguishing features: Strongly and distinctively pentagonal and flat. Arms very short, tips gently upturned. Upper surface with regularly arranged, 4–6 sided plates, covered in granules. Madreporite small, naked, 5-sided, slightly raised, and near disc centre. Upper marginal plates form a definite, bevelled edge to the disc and arms, and number 26 from arm tip to arm tip. Tube-feet with sucking discs, in two rows.

Colour: Bright red or reddish-orange above, cream below.

Size: Total width up to 200 mm.

Distribution: Widespread in the Pacific, South Atlantic, and southern Indian Ocean. Found throughout much of southern New Zealand, but more common south of the Chatham Rise, including the Bounty Islands and Macquarie Island. Not recorded north of the Bay of Plenty.

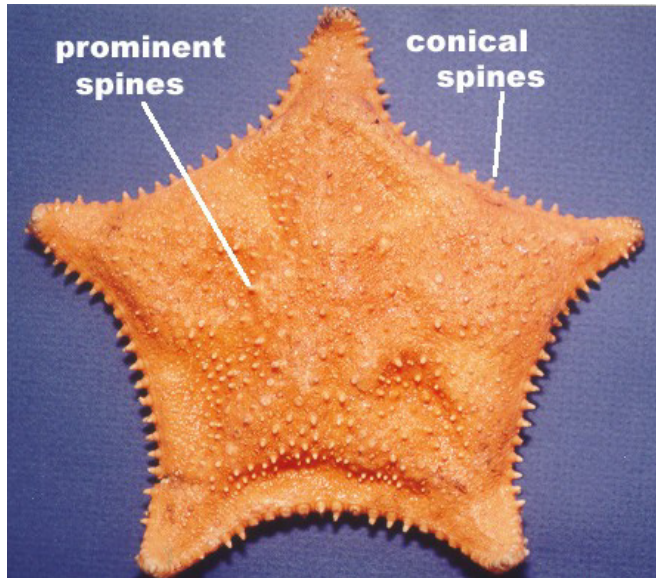
Depth: 200 to 1200 m.

Similar species: *Ceramaster patagonicus australis* (known only from the Macquarie Ridge) differs in the lack of pedicellariae (jaw-like appendages) on the upper marginal plates. Small specimens from seamounts may represent different species. Species of *Pillsburiaster* differ in having rounded plates on the upper surface, and those of *Sphaeriodiscus* have scattered granules over the marginal plates.

References: Clark, H.E.S.; McKnight, D.G. (2001). The marine fauna of New Zealand: Echinodermata: Asteroidea (sea-stars). Order Valvatida. *NIWA Biodiversity Memoir 117*: 33–36.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Valvatida
Family Goniasteridae

***Hippasteria phrygiana* (Trojan star) (HTR)**



Distinguishing features: Five short arms, disc large, near pentagonal, and usually inflated. Sturdy, blunt, conical spines form 2 rows on marginal plates (1–3 spines per plate). Large and small plates of the upper surface rounded, both with granules, the larger often with an erect spine. Tube-feet with sucking discs, in 2 rows.

Colour: Pale orange above, paler cream below.

Size: Total width up to 320 mm.

Distribution: Widely distributed in the northern hemisphere and in Australia (New South Wales and Victoria). In New Zealand it occurs from the Bay of Plenty south. Common on the Chatham Rise.

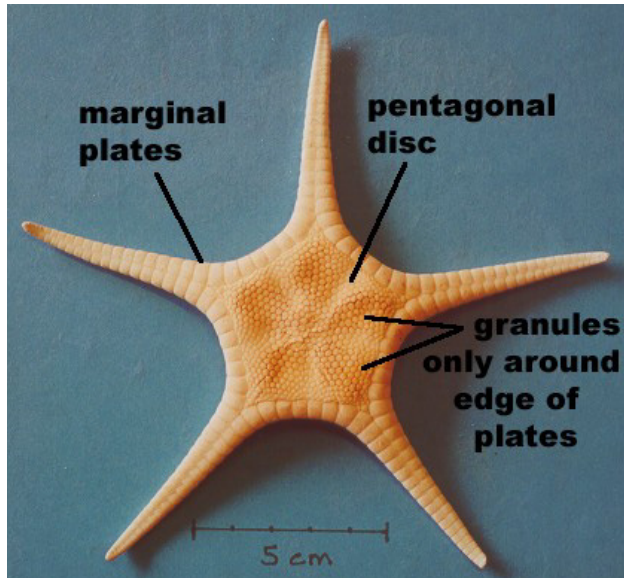
Depth: 20 to 1300 m. Most records from deeper than 500 m.

Similar species: The strong spines on the margins help to distinguish this species from similar shaped goniasterids such as *Mediaster* spp. and *Gilbertaster anacanthus*, which lack these spines, as does a rare species of *Hippasteria* from south of Tasmania.

References: Clark, H.E.S.; McKnight, D.G. (2001). The marine fauna of New Zealand: Echinodermata: Asteroidea (sea-stars). Order Valvatida. *NIWA Biodiversity Memoir 117*: 54–59.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Valvatida
Family Goniasteridae

Lithosoma novaezelandiae (Rock star) (LNV)



Distinguishing features: Disc pentagonal, bordered by conspicuous upper marginal plates which completely encase the arms from base to tip. Plates of the upper surface naked, ringed with small granules, close-fitting, mostly hexagonal, and very regularly arranged into rows. Madreporite small, naked, between arms, and nearer centre than edge of disc. Marginal plates relatively much larger in juveniles. Tube-feet with terminal sucking discs, in 2 rows.

Colour: Pale brown-cream above, light fawn below.

Size: Total width up to 320 mm.

Distribution: Widespread around New Zealand from north of the North Island to the Campbell Rise, but not known from the east coast between East Cape and Christchurch or from the west coast between North Cape and Cape Farewell.

Depth: 120 to 1200 m. Most common at 600 to 800 m.

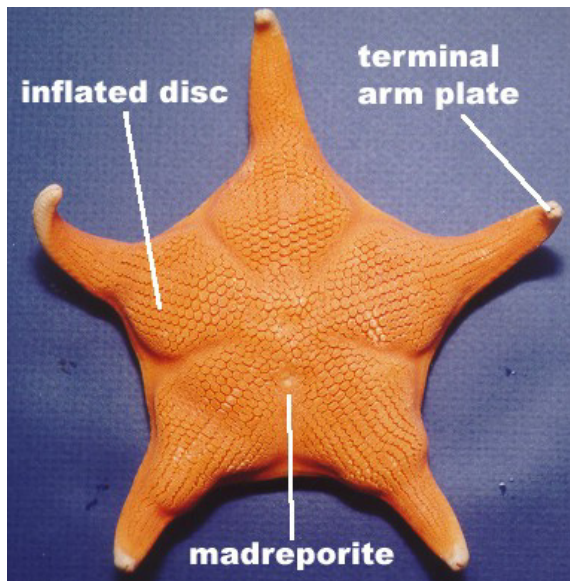
Similar species: *Glyphodiscus mcknighti*, from near Norfolk Island, is very similar. Two species of *Rosaster* also have the upper surface of the arms composed only of marginal plates, but plates of the upper surface are covered with granules.

References: Clark, H.E.S.; McKnight, D.G. (2001). The marine fauna of New Zealand: Echinodermata: Asteroidea (sea-stars). Order Valvatida. *NIWA Biodiversity Memoir 117*: 63–69.

McKnight, D.G. (1973). Additions to the asteroid fauna of New Zealand: Family Goniasteridae. *NZOI Records 1(13)*: 172–195.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Valvatida
Family Goniasteridae

***Mediaster sladeni* (Sladen's star) (MSL)**



Distinguishing features: Disc large, irregularly inflated centrally and at arm bases. The 5 arms slender, evenly tapering to oval terminal plates. Plates on upper surface are regular in shape (having an oval, enlarged, flattened head) and form a close cover. Some plates bear in their centre relatively conspicuous pedicellariae (jawlike appendages) with 2–3 jaws. Madreporite hexagonal, between arms, and nearer to disc than to marginal plates.

Colour: Orange.

Size: Total width up to 230 mm. Average width about 120 mm.

Distribution: From Three Kings Islands in the north to south of The Snares. Many records from the Chatham Rise.

Depth: 40 to 1000 m.

Similar species: *Mediaster gartrelli*, known from similar depths, but only from off Taranaki and the Kermadec Islands, has shorter arms; *M. arcuatus*, widespread at 600–1300 m, has shorter arms.

References: Clark, H.E.S.; McKnight, D.G. (2001). The marine fauna of New Zealand: Echinodermata: Asteroidea (sea-stars). Order Valvatida. *NIWA Biodiversity Memoir 117*: pp. 78–82.

McKnight, D.G. (1973). Additions to the asteroid fauna of New Zealand: Family Goniasteridae. *NZOI Records 1(13)*: 172–195.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Valvatida
Family Odontasteridae

***Odontaster benhami* (Pentagonal tooth-star) (ODT)**



Distinguishing features: Outline roughly pentagonal, with a variable degree of arc between arm tips. Marginal plates separated by shallow grooves and slightly larger nearer the disc. On the underside, each of the oral plates (at the side of the mouth) has a larger, usually visible, backward-curving, glassy spine; tube-feet with sucking discs, in 2 rows.

Colour: Dull coloured, mostly light brown, reddish or orange, almost cream below.

Size: Total width up to 80 mm.

Distribution: The species has a generally southern distribution in the New Zealand region, from Cook Strait to near The Snares.

Depth: 0 to 550 m.

Similar species: Two other species occur in the New Zealand region, both superficially similar to *Odontaster benhami*. A lab examination may be necessary to separate them; *O. aucklandensis* is mainly subantarctic, 55–350 m, and *O. rosagemmae* occurs off the east coast of North Island and east of the Chatham Islands, 450–1200 m. Species of *Diplodontias* (in the same family) are also quite similar.

References: Clark, H.E.S.; McKnight, D.G. (2001). The marine fauna of New Zealand: Echinodermata: Asteroidea (sea-stars). Order Valvatida. *NIWA Biodiversity Memoir 117*: 144–145.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Velatida
Family Solasteridae

***Crossaster multispinus* (Sun-star) (CJA)**



Distinguishing features: Wide, flattened disc, with 11–12 arms; plates of upper surface spaced apart, each with a bundle of spinelets up to 5–10 mm long. Only lower marginal plates apparent, with short spines and granules; tube-feet with sucking discs, in 2 rows.

Colour: Orange-pink, whitish-pink, or mauve above.

Size: Total width up to 140 mm.

Distribution: Present throughout the New Zealand region, from the Kermadec Islands to the Campbell Plateau.

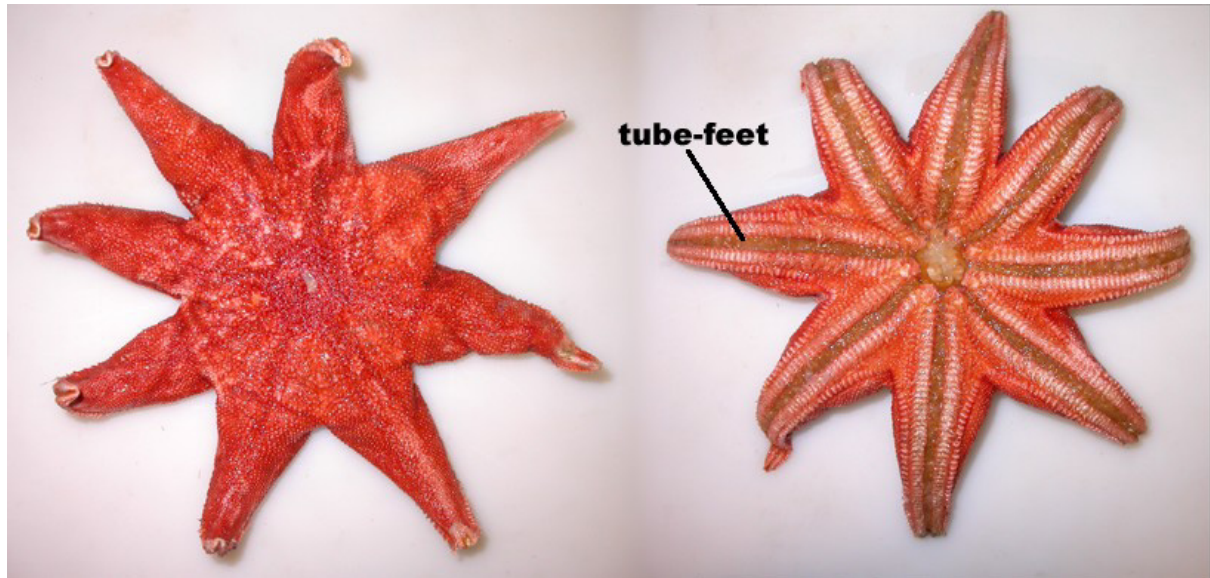
Depth: 90 to 1200 m.

Similar species: One other species, with 10 arms, is known from central and southern New Zealand, 200–400 m.

References: McKnight, D.G. (in press). The marine fauna of New Zealand. Echinodermata: Asteroidea (sea-stars). Orders Velatida, Spinulosida, Forcipulatida and Brisingida. *NIWA Biodiversity Memoir*.

Phylum Echinodermata
Class Asterozoa (sea-stars)
Order Velatida
Family Solasteridae

***Solaster torulatus* (Chubby sun-star) (SOT)**



Distinguishing features: With 7 to 9 arms, usually 8. Disc near flat, arms rounded, plump at the base. Upper marginal plates smaller than lower, which bear spinelets in a transverse row. Groups of 1–5 spines present on each plate of the upper surface. Tube-feet with sucking discs, in 2 rows.

Colour: Uniform orange (ranging to light brown) above, orange to light brown with paler tube-feet below.

Size: Total width up to 300 mm.

Distribution: Widespread over the Chatham Rise and sub-Antarctic. Also known from the Kermadec Islands and the east coast of the North Island, Australia, and Japan.

Depth: 219 to 1550 m.

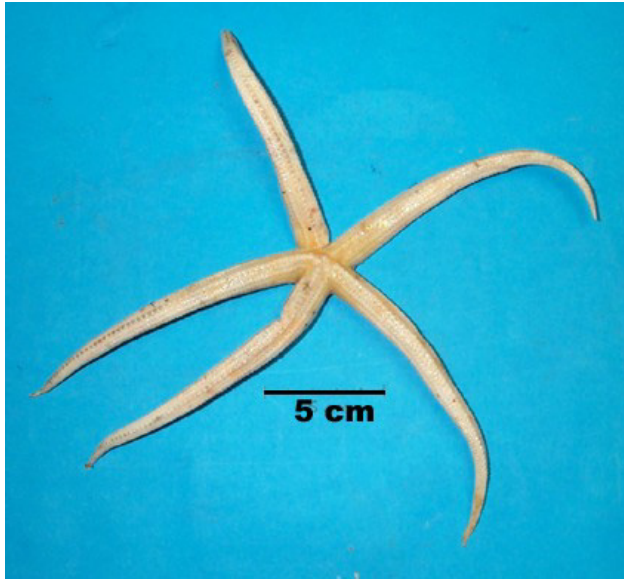
Similar species: Other sun-stars (family Solasteridae), such as *Crossaster japonicus*, which is common. It differs from *S. torulatus* in having finer, longer, and more numerous spines on the more closely spaced plates of the upper surface.

References: McKnight, D.G. (in press). The marine fauna of New Zealand. Echinodermata: Asterozoa (sea-stars). Orders Velatida, Spinulosida, Forcipulatida and Brisingida. *NIWA Biodiversity Memoir*.

McKnight, D.G. (1973). Additions to the asteroid fauna of New Zealand: Families Radiasteridae, Solasteridae, Pterasteridae, Asterinidae, Ganeriidae and Echinasteridae. *NZOI Records 2(1)*. 15 p.

Phylum Echinodermata
Class Asteroidea (sea-stars)
Order Forcipulatida
Family Zoroasteridae

Zoroaster spp. (Rat-tail stars) (ZOR)



Distinguishing features: Five long rounded arms and a small disc; plates regularly arranged, marginal plates not conspicuous. Plates of upper surface with one or more spines and shorter spinelets. Tube-feet in 4 rows, sometimes 2 rows near arm tip; small pedicellariae (jaw-like appendages) scattered on upper surface, and on spines along groove by the tube-feet. Six species are recorded locally. Illustrated is *Z. spinulosus*.

Colour: Brownish or orange or pale, usually a little lighter below.

Size: Up to 400 mm.

Distribution: Throughout the New Zealand region.

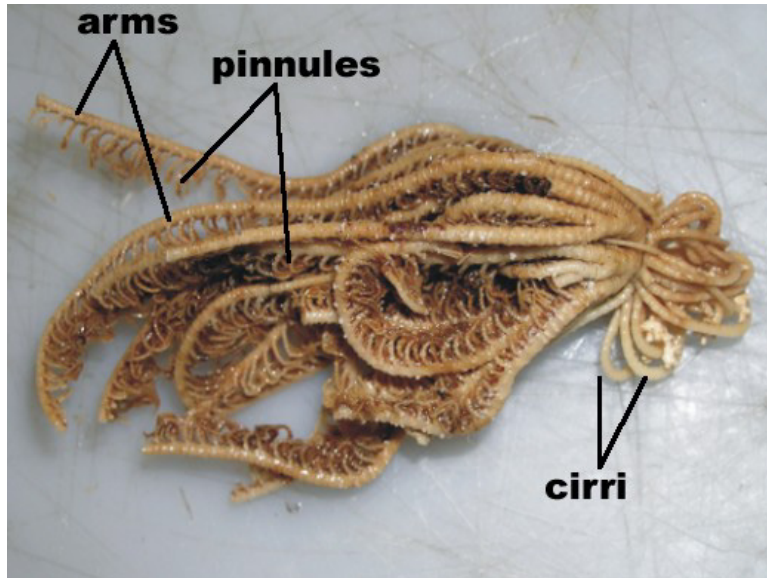
Depth: 150 to 2200 m.

Similar species: None.

References: McKnight, D.G. (in press). The marine fauna of New Zealand. Echinodermata: Asteroidea (sea-stars). Orders Velatida, Spinulosida, Forcipulatida and Brisingida. *NIWA Biodiversity Memoir*.

Phylum Echinodermata
Class Crinoidea (sea lilies and feather stars)
Order Comatulida (feather stars)
Family

(Feather stars) (CMT)



Distinguishing features: Stalks are vestigial in this modern branch of the crinoids although their cirri remain, encircling the base of the 5–40 arms. The cirri are used for grasping the substrate when the animal is at rest, and are long and slender in soft bottom forms and short and stout in forms that rest on rocks, corals, etc. Each arm bears a row of pinnules producing a feather like appearance. They are fragile, and often only fragments are present in a sample.

Colour: Various, often strikingly coloured, but deepwater species more likely to be yellow or brown.

Size: From 10 to 35 cm (arm length).

Distribution: Widespread, but rare in the New Zealand region. They occur on soft or hard substrates.

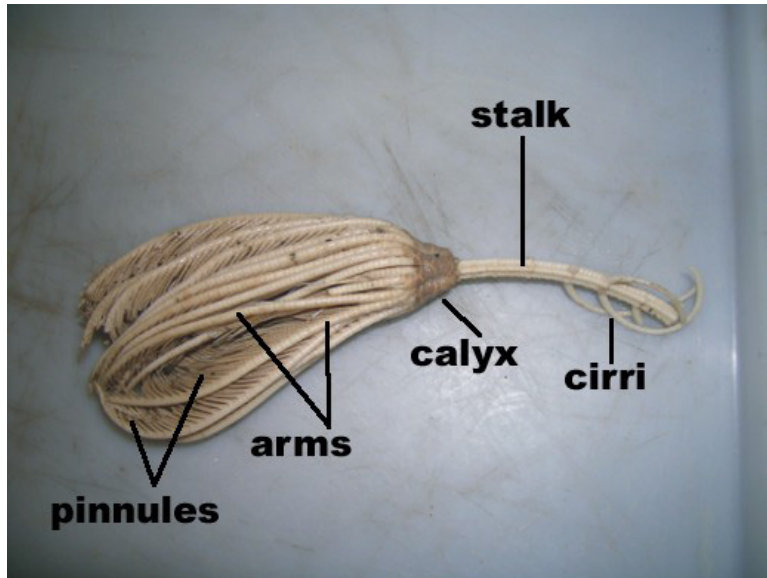
Depth: 50 to 2500 m. Range may be greater.

Similar species: At least 40 species of feather stars are present in the New Zealand region, and a microscopic examination is needed for species determination. Can be distinguished from sea lilies by the absence of a stalk. The photo is of *Oxycomanthus* sp.

References: McKnight, D.G. (1977). Additions to the New Zealand crinoid fauna. *NZOI Records* 3 (11): 93–112.

Phylum Echinodermata
Class Crinoidea (sea lilies and feather stars)
Order Isocrinida (sea lilies)
Family

(Sea lilies with cirri) (CRN)



Distinguishing features: Sea lilies attach to the substrate with a stalk, up to 1 m long, topped with feathery arms arising from a small body (calyx). In this order small, segmented, cirri are present on the stalks. There are 5 arms at the base but they usually branch several times. A large specimen may have 40 or more arms. Each arm bears a row of small branches (pinnules) which bear the small tube-feet and produce a feather like appearance. Sea lilies are fragile, and often only fragments are salvaged.

Colour: Various. Reported as emerald green, purplish, or grey.

Size: Total length up to 100 cm.

Distribution: Sea lilies are mostly found in deep water, especially on seamounts and, although rare in collections, are probably widespread in the New Zealand region.

Depth: 100 to 2000 m.

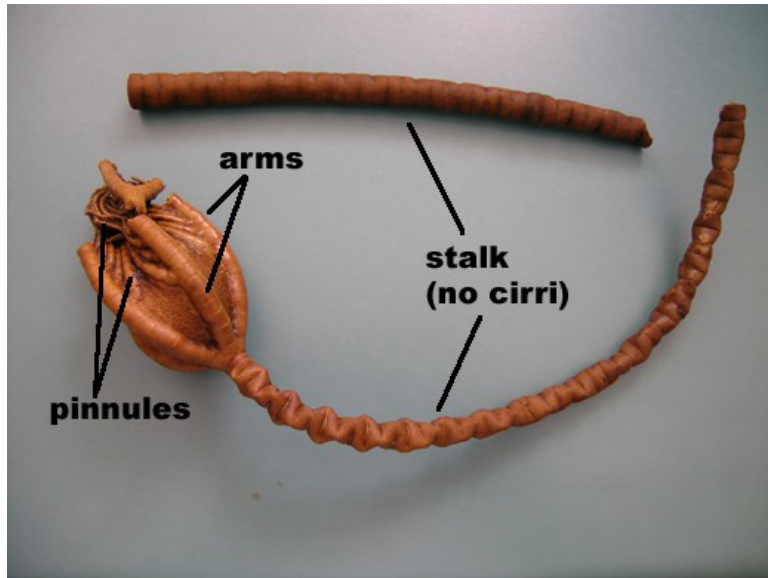
Similar species: Can be distinguished from feather stars (order Comatulida) by the presence of a stalk, and from the other two orders of sea-lilies (Millericrinida and Cyrtocrinida) by the presence of cirri on the stalk. The photo is of *Metacrinus* sp.

References: McKnight, D.G. (1977). Additions to the New Zealand crinoid fauna. *NZOI Records* 3 (11): 93–112.

McKnight, D.G. (1973). Stalked crinoids from the New Zealand region. *NZOI Records* 1(14): 199–210.

Phylum Echinodermata
Class Crinoidea (sea lilies and feather stars)
Order Millericrinida, Cyrtocrinida (sea lilies)
Family

(Sea lilies without cirri) (CRN)



Distinguishing features: Sea lilies attach to the substrate with a stalk, up to 1 m long, topped with feathery arms arising from a small body (calyx). No cirri are present on the stalks in this order. Each arm bears a row of small branches (pinnules) which bear the small tube-feet and produce a feather-like appearance. Sea lilies are fragile, and often only fragments are salvaged.

Colour: Various.

Size: Total length up to 100 cm.

Distribution: Recorded from seamounts and areas of steep rocky relief throughout the New Zealand region.

Depth: 400 to 1500 m.

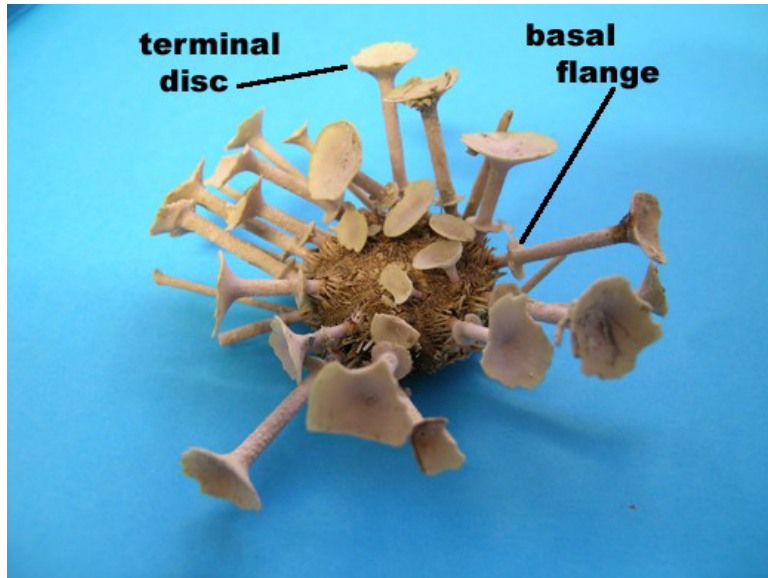
Similar species: The only species likely to be present in trawl samples is *Phrynocrinus nudus* (pictured). It is similar in size to the isocrinid sea-lilies but, like all other members of these two orders, it lacks cirri on the stalk, and the arms branch irregularly.

References: McKnight, D.G. (1977). Additions to the New Zealand crinoid fauna. *NZOI Records 3 (11)*: 93–112.

McKnight, D.G. (1973). Stalked crinoids from the New Zealand region. *NZOI Records 1(14)*: 199–210.

Phylum Echinodermata
Class Echinoidea (sea urchins)
Order Cidaroida
Family Cidaridae

***Goniocidaris parasol* (Parasol urchin) (GPA)**



Distinguishing features: Larger spines long and thick, often encrusted with sponges, polyzoa, and hydroids. Spines on the upper surface terminating in a large, umbrella-like disc and bearing a complete or partial disc or flange at their base.

Colour: Test and secondary spines pale brown/cream, primary spines cream.

Size: Diameter up to 30 mm (spines up to 50 mm).

Distribution: Common from the Chatham Rise to the Campbell Plateau.

Depth: 200 to 1000 m.

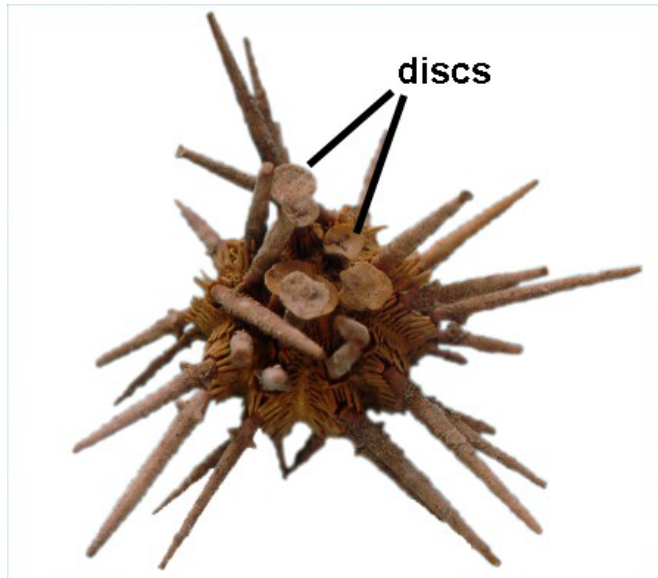
Similar species: May be confused with *G. umbraculum*, which also has umbrella-like discs on their large spines, but the spines themselves are longer and instead of a disc or flange bear spurs or thorns at the base. *G. umbraculum* is more common in shallower waters, 20–200 m.

References: Fell, H.B. (1958). Deep-sea echinoderms of New Zealand. *Zoology Publications from Victoria University of Wellington* 24. 40 p.

Fell, H.B. (1960). Biological results of the Chatham Islands 1954 Expedition. Part 2. Archibenthal and littoral echinoderms. *NZOI Memoir* 5. 98 p.

Phylum Echinodermata
Class Echinoidea (sea urchins)
Order Cidaroida
Family Cidaridae

***Goniocidaris umbraculum* (Umbrella urchin) (GOU)**



Distinguishing features: Primary spines long, thick, pale coloured, and often encrusted with sponges, polyzoa, and hydroids. Spines on upper surface bearing terminal, small, umbrella-like discs and basal spurs or thorns.

Colour: Larger spines brown, those at the circumference tinged with green near the base.

Size: Diameter up to 30 mm. Larger spines up to 45 mm.

Distribution: Well known from Foveaux strait where they were commonly caught in oyster dredges. Also found off the east coast of the South Island up to Cook Strait.

Depth: 20 to 200 m.

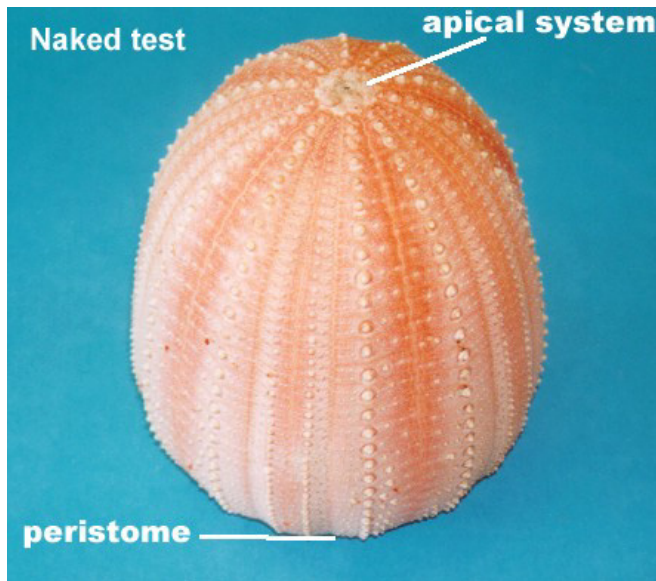
Similar species: The larger spines of *G. parasol* are shorter than those of *G. umbraculum* and have larger terminal umbrellas and a complete or partial disc or flange close to their base. *G. parasol* is more common on the Chatham Rise and elsewhere south of Cook Strait, in deeper waters. Other species of *Goniocidaris* and *Ogmocidaris benhami*, all found in northern waters, may also have umbrella-like spines.

References: Fell, H.B. (1960). Biological results of the Chatham Islands 1954 Expedition. Part 2. Archibenthal and littoral echinoderms. *NZOI Memoir No. 5*. 94 p.

Barker, M.F. (1984). Reproduction and development in *Goniocidaris umbraculum*, a brooding echinoid. *Proceedings of the 5th International Echinoderm Conference, Galway, 1984*: pp. 207–214.

Phylum Echinodermata
Class Echinoidea (sea urchins)
Order Echinoidea
Family Echinidae

***Dermechinus horridus* (Deepsea urchin) (DHO)**



Distinguishing features: Test height the largest of any sea urchin (to over 130 mm) and (in large specimens) usually greater than the test diameter. Apical system and peristome very small and of similar size. Larger spines long and slender, forming vertical series. Secondary spines very numerous, fine, bearing thorns, and terminating in a hook.

Colour: Test dull to bright red/orange, primary spines orange, smaller spines sometimes whitish.

Size: Diameter up to 110 mm. Test height 30 to 130 mm.

Distribution: Circumpolar (South Africa, South America, South Australia). Widespread in New Zealand (Northland, Challenger Plateau, Bay of Plenty, west coast South Island, Kaikoura, and the Chatham Rise).

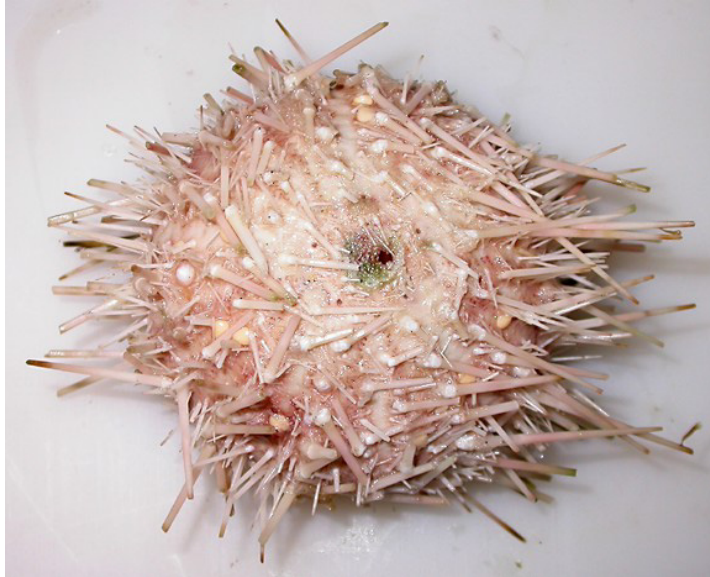
Depth: 200 to 1200 m.

Similar species: The only other New Zealand species in this family, *Gracilechinus multidentatus*, is unlikely to be confused with *D. horridus* due to its much paler colour and more numerous and robust primary spines. Smaller specimens, which have not yet become very tall, could be confused with *Pseudechinus flemingi*, but the peristome and apical system of this species are relatively large.

References: McKnight, D.G. (1974). Some echinoids new to New Zealand waters. *New Zealand Oceanographic Institute Records* 2(3): 27–44.

Phylum Echinodermata
Class Echinoidea (sea urchins)
Order Echinoidea
Family Echinidae

***Gracilechinus multidentatus* (Deepsea kina) (GRM)**



Distinguishing features: Large test, variable in ratio of test diameter to height. Larger spines 30–35 mm long and tapered. Probably the most common species of sea urchin in trawl bycatch in the New Zealand region; often caught in large numbers, especially on the south Chatham Rise. The roe are edible when ripe (late August-early September on the Chatham Rise).

Colour: Test colour variable but always very pale, either pink, cream, or light brown. Spines are pink/white and darker at the tips.

Size: Diameter up to 100 mm. Spines about equal in length to test diameter.

Distribution: Found from the Chatham Rise, where it is very common, and south.

Depth: 300 to 1200 m.

Similar species: The only other member of the family in New Zealand, *Dermechinus horridus*, is bright orange.

References: McKnight, D.G. (1968). Additions to the echinoid fauna of New Zealand. *New Zealand Journal of Marine and Freshwater Research* 2: 90–110.

Phylum Echinodermata
Class Echinoidea (sea urchins)
Order Echinothurioida (Tam O'Shanters)
Family Echinothuriidae, Phormosomatidae

(Tam O'Shanters) (TAM)



Distinguishing features: Test flexible, usually compressed into a disc or frisbee-like shape when captured. Larger spines usually more numerous on lower surface than upper; larger spines terminate in a whitish hoof-like piece or a glandular bag. Spines readily brush off with capture. Handle with care as some deliver a painful sting.

Colour: Purple, sometimes streaked with white, bright-reddish, or brown.

Size: Diameter up to 150 mm.

Distribution: Widespread locally, throughout the New Zealand region.

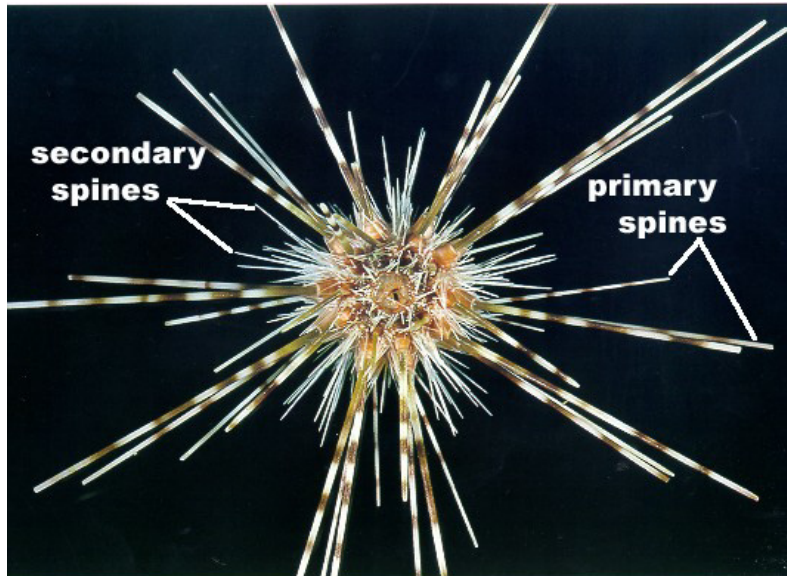
Depth: 200 to 3000 m. Possibly deeper.

Similar species: At least 9 species are known from New Zealand waters, and more may be expected, as this group of echinoderms is not well studied.

References: Baker, A.N. (1972). *Araeosoma coriaceum* (A. Agassiz) and *Pseudoboletia indiana* (Michelin), new to New Zealand, with notes on other echinoids from the Bay of Plenty, New Zealand. *Records of the Dominion Museum* 8(2): 9–19.

Phylum Echinodermata
Class Echinoidea (sea urchins)
Order Pedinoidea
Family Pedinidae

***Caenopedina novaezelandiae* (Banded-spine urchin) (CNO)**



Distinguishing features: Test height about half of the test diameter. Primary spines up to 3 times test diameter with broad colour bands (up to about 5 mm wide). Secondary spines long and generally white, sometimes with green-tinged tips. All spines bear numerous spinelets.

Colour: Larger spine bands green (especially near base), white, and reddish brown. Shorter spines generally white, sometimes with green-tinged tips. Test white/brownish-green; apical system (centre of upper surface) green.

Size: Diameter up to 30 mm.

Distribution: Bay of Plenty north.

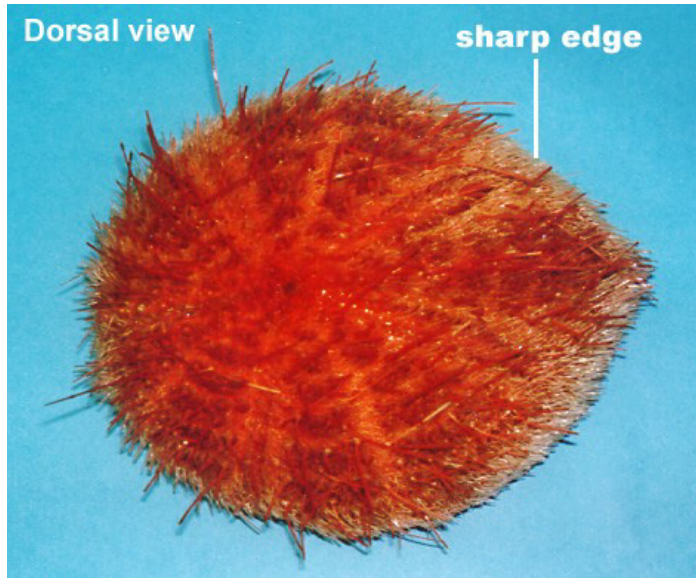
Depth: 300 to 500 m.

Similar species: Two other species of *Caenopedina* are known from the New Zealand region, both are more or less uniform reddish-brown in colour. One is known from near Norfolk Island, the other from off Dunedin.

References: Pawson, D.L. (1964). The genus *Caenopedina* in New Zealand. *Transactions of the Royal Society of New Zealand* 5(5): 63–70.

Phylum Echinodermata
Class Echinoidea (sea urchins)
Order Spatangoida (heart urchins)
Family Spatangidae

***Paramaretia peloria* (Microsoft mouse) (PMU)**



Distinguishing features: Test ovate and low, lower surface very flat to concave and upper surface evenly rounded. Frontal notch absent. Edge of upper surface sharp. Upper surface densely covered in tubercles, strongly sunken into the test. Spines slightly curved but usually broken.

Colour: Test dull grey, spines reddish-brown above, paler on sides.

Size: Total length up to 90 mm.

Distribution: S.E. Australia (NSW, Victoria, Tasmania), widespread in New Zealand from Stewart Island to Three Kings Islands, including the Chatham Rise.

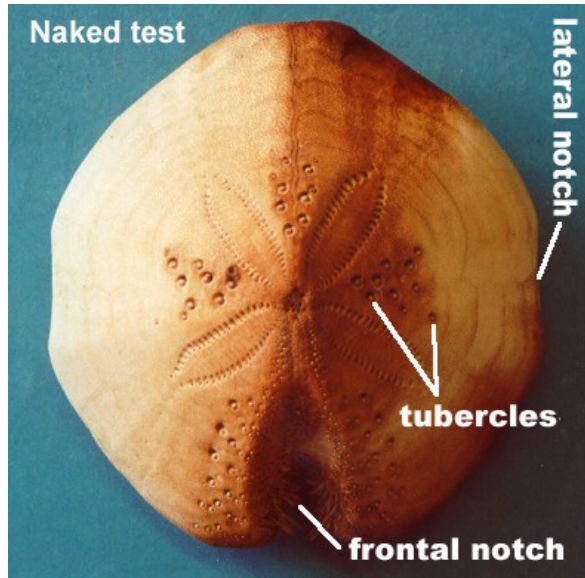
Depth: 50 to 700 m.

Similar species: *Paramaretia tuberculata*, although less common, has a similar distribution in New Zealand. It can be distinguished from *P. peloria* by the much fewer number of large tubercles on the upper surface and the more rounded test edge.

References: Baker, A.N.; Rowe, F.W.E. (1990). Atelostomatid sea urchins from Australian and New Zealand waters (Echinoidea: Cassiduloida, Holasteroida, Spatangoida, Neoplampadoida). *Invertebrate Taxonomy* 4: 281–316.

Phylum Echinodermata
Class Echinoidea (sea urchins)
Order Spatangoida (heart urchins)
Family Spatangidae

Spatangus mathesoni (Matheson's heart urchin) (SMT)



Distinguishing features: Test large, heart-shaped in outline and tent-shaped in profile with a deep frontal notch and shallow lateral notches. The upper surface is not inflated (i.e., flat rather than convex). On upper surface large, sunken, spine bearing tubercles are limited to the area between the petaloid ambulacra. Upper surface also covered by a dense coat of small spines. On the lower surface the spines are longer but less dense.

Colour: Deep reddish-brown, purple in preserved specimens.

Size: Diameter up to 110 mm.

Distribution: Challenger Plateau, east and west coasts of the North Island, Chatham Rise.

Depth: 650 to 1050 m.

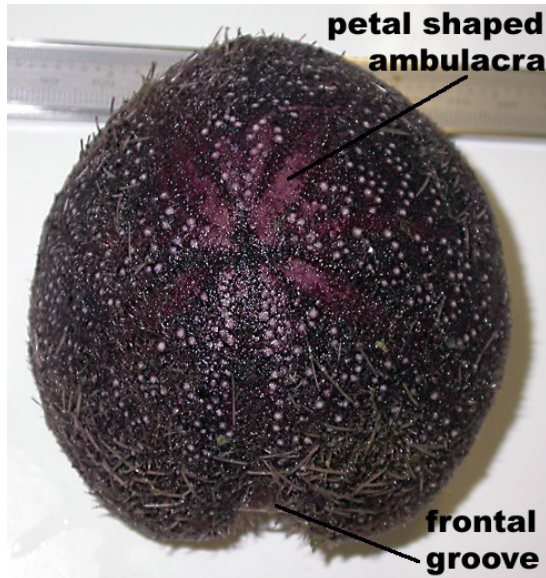
Similar species: *Spatangus multispinus* has numerous larger spines all over the inflated upper surface; *S. lutkeni* has fewer spines but is also quite strongly inflated on the upper surface.

References: Baker, A.N.; Rowe, F.W.E. (1990). Atelostomatid sea urchins from Australian and New Zealand waters (Echinoidea: Cassiduloida, Holasteroida, Spatangoida, Neoplampadoida). *Invertebrate Taxonomy* 4: 281–316.

McKnight, D.G. (1968). Additions to the echinoid fauna of New Zealand. *New Zealand Journal of Marine and Freshwater Research* 2: 90–110.

Phylum Echinodermata
Class Echinoidea (sea urchins)
Order Spatangoida (heart urchins)
Family Spatangidae

***Spatangus multispinus* (Purple-heart urchin) (SPT)**



Distinguishing features: Broadly oval-heart-shaped large test with a deep frontal notch. The distinct, petaloid (petal-shaped) ambulacra lie close to flush with the surface of the test. Primary spines long, erect, and fairly dense on upper surface.

Colour: Test and spines a deep, rich violet fading to mauve after preservation.

Size: Diameter up to 100 mm.

Distribution: Found throughout New Zealand, especially off the east coasts of the North and South Islands, the Chatham Rise, and Stewart Island.

Depth: 30 to 1000 m.

Similar species: *Spatangus mathesoni* tends to be larger and have a sharper latero-ventral margin. Also *S. lutkeni* (very similar, but less common) and *S. capensis* (rare). These species generally have fewer larger tubercles, limited on the upper surface to the areas between the petaloid ambulacra.

References: Baker, A.N.; Rowe, F.W.E. (1990). Atelostomatid sea urchins from Australian and New Zealand waters (Echinoidea: Cassiduloidea, Holasteroidea, Spatangoida, Neoplampadoidea). *Invertebrate Taxonomy* 4: 281–316.

McKnight, D.G. (1969). An outline of the New Zealand shelf fauna: benthos survey, station list, and distribution of the Echinoidea. *New Zealand Oceanographic Institute Memoir* 47. 86 p.

Phylum Echinodermata
Class Echinoidea (sea urchins)
Order Temnopleuroida
Family Temnopleuridae

***Pseudechinus flemingi* (Fleming's urchin) (PFL)**



Distinguishing features: Long, fine, densely matted larger spines of length up to equal the test diameter. Test slightly flattened, especially on lower surface. Peristome (membranous area at centre of lower surface) is wider than the apical system (area at centre of upper surface).

Colour: Spines a rich orange-red or deep salmon colour, test a rich rose red with paler rose tubercles (spine supports).

Size: Diameter up to 50 mm.

Distribution: Found on the Chatham Rise, especially the south flanks and around the Mernoo Bank, and off Otago.

Depth: 90 to 600 m.

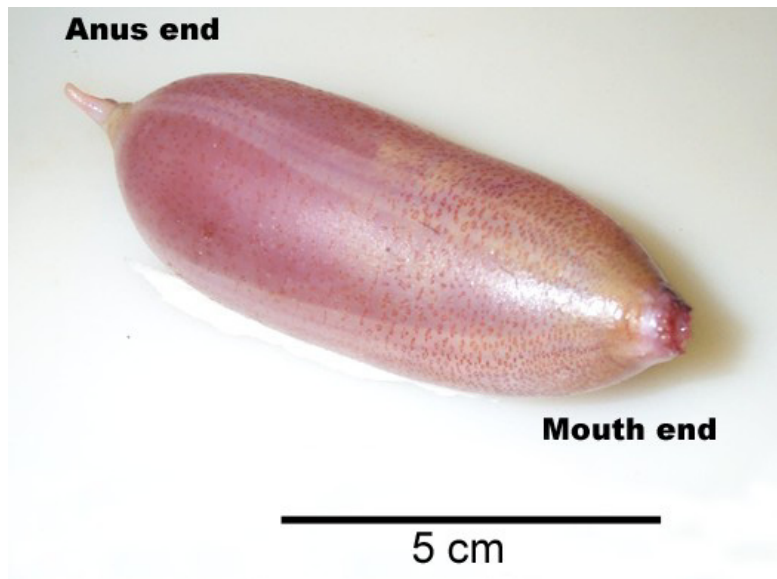
Similar species: The 4 other species of *Pseudechinus* found in the New Zealand region are of a similar size and shape, but are duller in colour, and generally found in shallower water. *Dermechinus horridus* is a similar colour but has shorter spines, a taller test (in large specimens), and smaller, even sized, apical systems and peristomes.

References: Fell, H.B. (1958). Deep-sea echinoderms of New Zealand. *Zoology Publications from Victoria University of Wellington* 24. 40 p.

McKnight, D.G. (1969). An outline distribution of the New Zealand shelf fauna. *New Zealand Oceanographic Institute Memoir* 47. 91 p.

Phylum Echinodermata
Class Holothuroidea (sea cucumbers)
Order
Family

(Sea cucumbers) (HTH)



Distinguishing features: Holothurians generally have a soft, cylindrical, body with the mouth and anus at opposite ends; mouth surrounded by feeding tentacles, usually retracted on capture; 5 rows of tube feet, absent in the order Apodida. The calcite skeleton, common to all echinoderms, reduced to mostly microscopic plates embedded in the body wall. These plates are used to differentiate between species, and for that reason a laboratory examination is usually required for identification.

Colour: Usually pale, brownish, or reddish.

Size: Up to 300 mm.

Distribution: Throughout the New Zealand region, from the intertidal to abyssal depths, where they may make up to 90% of the benthic biomass.

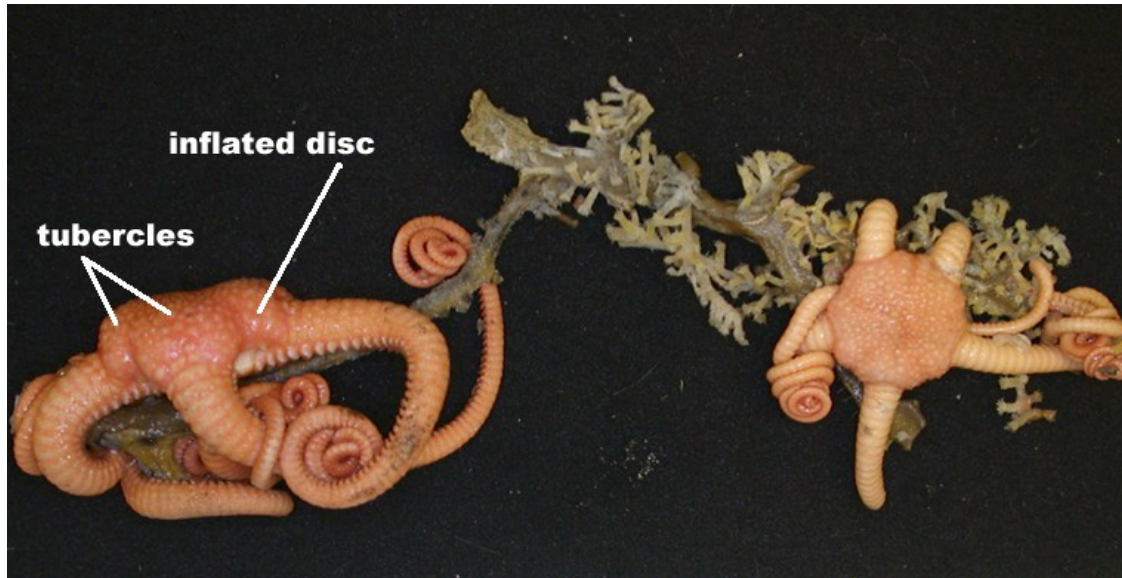
Depth: 0 to 3000 m.

Similar species: More than 100 species, with representatives of all 6 orders of holothurians, have been recorded from the New Zealand region. Pictured is a species of the order Molpadiida, in which the posterior end of the body is narrowed to a tail. Known commercially as *bêche-de-mer*.

References: McKnight, D.G.; Eagle, M.K.; Pawson, D.L.; Ameziane, N.; Vance, D.J.; Baker, A.N.; Clark, H.E.S.; Alcock, N. (in press): Phylum Echinodermata - sea-stars, brittlestars, sea urchins, sea cucumbers, sea lilies, and kin. *In*: Gordon, D.P. (ed.), The New Zealand inventory of biodiversity. Volume 1. Kingdom Animalia - Radiata, Lophotrochozoa, and Deuterostomia. Canterbury University Press.

Phylum Echinodermata
Class Ophiuroidea (brittle stars)
Order Euryalinida (basket stars, snake stars)
Family Gorgonocephalidae

Astrothorax waitei (Waite's snake-star) (AWA)



Distinguishing features: Five unbranched arms. Disc inflated above, flat on underside; upper surface completely covered with larger and smaller tubercles, those on the underside with finer, uniform granulation. Arms with transverse bands of granules, interspersed with narrow, smooth, depressed bands; 5–10 short, thorny, arm spines at outer margins of underside of arms. Mouth with distinct spines along margins; genital slits present at edge of disc, between the arms.

Colour: Creamy white to pinkish-orange.

Size: Up to 20 mm (disc diameter). Arms up to 100 mm.

Distribution: Widespread throughout the New Zealand region, near Norfolk Island to the Chatham Rise. Also known from Australia and South Africa.

Depth: 120 to 1200 m.

Similar species: At least 6 other snake-star species are recorded in this family.

References: McKnight, D.G. (2000). The marine fauna of New Zealand. Basket-stars and snake-stars (Echinodermata: Ophiuroidea: Euryalinida). *NIWA Biodiversity Memoir 115*: 61–63.

Phylum Echinodermata
Class Ophiuroidea (brittle stars)
Order Euryalinida
Family Gorgonocephalidae

***Gorgonocephalus* spp. (Gorgon's head basket-stars) (GOR)**



Distinguishing features: Five long arms, branching extensively (up to 10 or more times) from near the disc or within the disc margin. The arms are deciduous and a large tangled mass of arms may be the only sample taken. Upper side of disc with 5 pairs of conspicuous radial ribs. Six species with branching arms are recorded from the New Zealand region, and 4 of these (in 2 genera) may be present in trawl catches. Laboratory examination is required to determine the species.

Colour: Creamy white to dull or pale brown. Radial ribs on disc usually paler.

Size: Up to 70 mm (disc diameter).

Distribution: *Gorgonocephalus chilensis*, mainly Chatham Rise; *G. dolichodactylus* mainly Bay of Plenty; *G. pustulatum* and *G. sundanus* rare but widespread.

Depth: 70 to 1400 m.

Similar species: None.

References: McKnight, D.G. (2000). The marine fauna of New Zealand. Basket-stars and snake-stars (Echinodermata: Ophiuroidea: Euryalinida). *NIWA Biodiversity Memoir 115*: 45–53.

Phylum Echinodermata
Class Ophiuroidea (brittle stars)
Order Ophiurida
Family Ophiodermatidae

***Bathypectinura heros* (Deepsea brittle star) (BHE)**



Distinguishing features: Arms sharply set off from disc, upper side of disc covered with small granules, rarely with some plates exposed; lower side of disc also covered, except around mouth, where plates are naked. Armspines short and closely pressed against sides of arms.

Colour: Reddish or brown.

Size: Up to 50 mm (disc diameter).

Distribution: Present in almost all oceans, and widespread around New Zealand.

Depth: 200 to 2500 m.

Similar species: None in the deeper waters. *Ophiopsammus maculata* is similar but is more or less confined to the continental shelf.

References: Paterson, G.L.J. (1985). The deep-sea Ophiuroidea of the North Atlantic Ocean. *Bulletin of the British Museum (Natural History)* 49. 162 p.

PHYLUM

Tunicata

Sea squirts and salps

Phylum Tunicata
Class Ascidacea (sea squirts)
Order Stolidobranchia
Family Styelidae

***Cnemidocarpa bicornuta* (ASC)**



Distinguishing features: Have inhalent and exhalant apertures and if squeezed should squirt out water from either or both siphons. Have tough leathery test or "tunic" and are often attached basally to cobbles or rocks. May be heavily encrusted with epibionts such as hydrozoans and bryozoans.

Colour: Highly variable – cream to brown.

Size: Total height from 0.5 to 10 cm.

Distribution: Widely distributed throughout New Zealand.

Depth: 5 to 300 m. Intertidal to continental shelf slope.

Similar species: Several tunicate species are found in New Zealand waters.

References: Miller, R.H. (1982). The marine fauna of New Zealand. *New Zealand Oceanographic Institute Memoir* 85. 114 p.

Stocker, L.J. (1985). An identification guide to some common New Zealand ascidians. University of Auckland Leigh Marine Laboratory, Auckland. 74 p.

Phylum Tunicata
Class Thaliacea (salps)
Order Pyrosomida
Family Salpidae

***Pyrosoma atlanticum* (PYR)**



Distinguishing features: *Pyrosoma* is a colonial thaliacean, with affinities to ascidians. *Pyrosoma* are gelatinous, transparent/opaque, free-swimming, and planktonic. They have oral siphons on the outside of the colony and an anal siphon on the inside. A light organ is present on each side of the brachial sac of each zooid and this gives the organism its name.

Colour: Pale transparent pink.

Size: Up to 20 m. Can grow to massive size.

Distribution: Very widespread – from tropical to temperate waters.

Depth: Throughout the water column.

Similar species: Several species of salps are found in the New Zealand region.

References: Van Soest, R.W.M. (1981). A monograph of the order Pyrosomatida (Tunicata, Thaliacea). *Journal of Plankton Research* 3: 603–631.

Index 1: Taxa listed alphabetically by common name. s, species; g, genus; f, family; f+, several families; c, class; o, order.

Common name	Scientific name	MFish code	Page
Abyssal star (s)	<i>Plutonaster knoxi</i>	PLT	122
Acorn barnacle (s)	<i>Smilium zancleanum</i>	BRN	113
Airy finger sponge (s)	<i>Callyspongia</i> cf. <i>ramosa</i>	CRM	25
Amphipod (o)	<i>Eurythenes gryllus</i>	EUG	89
Armless stars (s)	Brisingidae etc*	BRG	125
Bamboo corals (f)	Isididae	ISI	48
Banded-spine urchin (s)	<i>Caenopedina novaezelandiae</i>	CNO	142
Bivalve (c)	<i>Euciroa galathea</i>	EGA	65
Bivalve (c)	<i>Zygochlamys delicatula</i>	ZDE	67
Black corals (o)	Antipatharia	COB	44
Bubblegum coral (s)	<i>Paragorgia arborea</i>	PAB	46
Bushy hard coral (s)	<i>Goniocorella dumosa</i>	GDU	52
Cat's-foot star (s)	<i>Cosmasterias dyscrita</i>	CDY	119
Chiton (c)	Amphineura	CHT	64
Chubby sun-star (s)	<i>Solaster torulatus</i>	SOT	132
Common octopus (f+)	<i>Pinnoctopus cordiformis</i>	OCT	71
Crested cup coral (s)	<i>Desmophyllum dianthus</i>	DDI	51
Cross-fish (s)	<i>Sclerasterias mollis</i>	SMO	120
Deepsea anemones (f+)	<i>Liponema</i> spp.	LIP	42
Deepsea anemones (g)	<i>Bolocera</i> spp.	BOC	39
Deepsea blind lobster (s)	<i>Polycheles suhmi</i>	PSU	104
Deepsea brittle star (s)	<i>Bathypectinura heros</i>	BHE	150
Deepsea kina (s)	<i>Gracilechinus multidentatus</i>	GRM	140
Deepsea urchin (s)	<i>Dermechinus horridus</i>	DHO	139
Deepwater branching coral (f+)	<i>Solenosmilia variabilis</i>	SVA	53
Deepwater branching coral (f+)	<i>Enallopsammia rostrata</i>	ERO	54
Deepwater branching coral (f+)	<i>Oculina virgosa</i>	OVI	56
Deepwater octopus (f+)	<i>Benthoctopus tegginmathae</i>	BTE	68
Deepwater octopus (f+)	<i>Graneledone</i> spp.	DWO	70
Deepwater prawn (f+)	<i>Pasiphaea</i> aff. <i>tarda</i>	PBA	103
Deepwater prawns (f+)	<i>Oplophorus</i> spp.	ONO	100
Deepwater rock lobster (s)	<i>Projasus parkeri</i>	PPA	101
Eunice sea-worm (g)	<i>Eunice</i> (undescribed)	EUN	61
Feather stars (o)	Comatulida	CMT	134
Fibreglass cup sponge (s)	<i>Poecillastra laminaris</i>	PLN	29
Fish biter (s)	<i>Aega monophthalma</i>	AMO	107
Five-spined star (s)	<i>Benthopecten pikei</i>	BPI	124
Flabellum cup corals (g)	<i>Flabellum</i> spp.	COF	55
Fleming's urchin (s)	<i>Pseudechinus flemingi</i>	PFL	146
Floppy trumpet sponge (s)	<i>Acanthascus (Rhabdocalyptus)</i> sp.	GLS	32
Gastropod (c)	<i>Aeneator recens</i>	AER	73
Gastropod (c)	<i>Austrofuscus glans</i>	KWH	74
Gastropod (c)	<i>Calliostoma turnerarum</i>	CTN	75
Gastropod (c)	<i>Fusitriton magellanicus</i>	FMA	77
Gastropod (c)	<i>Coluzea mariae</i>	CMR	78
Geometric star (s)	<i>Psilaster acuminatus</i>	PSI	123
Giant file shell (s)	<i>Acesta maui</i>	AMA	66
Giant red mysid (s)	<i>Neognathophausia ingens</i>	GNA	109
Giant sea spiders (s)	<i>Colossendeis</i> spp.	PYC	110
Goblin prawn (s)	<i>Glyphocrangon lowryi</i>	GLO	95
Golden corals (f)	<i>Chrysogorgia</i> spp.	CHR	47

* Includes families Brisingidae, Hymenodiscidae, Novodiniidae, Freyellidae

Index 1—continued

Common name	Scientific name	MFish code	Page
Golden prawn (s)	<i>Plesionika martia</i>	PLM	102
Golden volute (s)	<i>Provocator mirabilis</i>	GVO	80
Gorgons head basket-stars (g)	<i>Gorgonocephalus</i> spp.	GOR	149
Hermit crab (f+)	<i>Diacanthurus rubricatus</i>	DIR	90
Hermit crab (f+)	<i>Sympagurus dimorphus</i>	SDM	91
Jack-knife prawn (s)	<i>Haliporoides sibogae</i>	HSI	106
Krill, squat lobsters (f)	<i>Munida</i> spp.	MNI	111
Lacey honeycomb sponge (s)	<i>Eurete</i> cf. <i>simplissima</i>	ESI	31
Long polyp soft corals (g)	<i>Telesto</i> spp.	TLO	43
Madrepora coral (s)	<i>Madrepora oculata</i>	MOC	57
Magnificent sea-star (s)	<i>Dipsacaster magnificus</i>	DMG	121
Maroon pimpled ear sponge (s)	<i>Aciculites pulchra</i>	APU	30
Matheson's heart urchin (s)	<i>Spatangus mathesoni</i>	SMT	144
Microsoft mouse (s)	<i>Paramaretia peloria</i>	PMU	143
Omega prawn (s)	<i>Lipkius holthuisi</i>	LHO	96
Orange frond sponge (s)	<i>Crella incrustans</i>	CIC	26
Ostrich egg sponge (s)	<i>Geodinella vestigifera</i>	GVE	27
Parasol urchin (s)	<i>Goniocidaris parasol</i>	GPA	137
Pentagon star (s)	<i>Ceramaster patagonicus patagonicus</i>	CPA	126
Pentagonal tooth-star (s)	<i>Odontaster benhami</i>	ODT	130
Prawn killer (s)	<i>Ibacus alticrenatus</i>	PRK	105
Precious corals (g)	<i>Corallium</i> spp.	CLL	45
Purple-heart urchin (s)	<i>Spatangus multispinus</i>	SPT	145
Quill worm (g)	<i>Hyalinoecia tubicola</i>	HTU	62
Rat-tail stars (s)	<i>Zoroaster</i> spp.	ZOR	133
Red hydrocorals (g)	<i>Errina</i> spp.	ERR	49
Rock star (s)	<i>Lithosoma novaezelandiae</i>	LNV	128
Royal red prawn (s)	<i>Aristaeomorpha foliacea</i>	AFO	92
Rubber sponge (s)	<i>Psammocinia</i> cf. <i>hawere</i>	PHW	28
Sabre prawn (s)	<i>Campylonotus rathbunae</i>	CAM	94
Salps (c)	<i>Pyrosoma atlanticum</i>	PYR	154
Scampi (s)	<i>Metanephrops challengerii</i>	SCI	98
Scarlet prawn (s)	<i>Aristaeopsis edwardsiana</i>	PED	93
Sea cucumbers (c)	Holothuroidea	HTH	147
Sea lilies with cirri (o)	Isocrinida	CRN	135
Sea lilies without cirri (o+)	Millericrinida, Cyrtocrinida	CRN	136
Sea slug, nudibranch (o)	Generic nudibranch	NUD	76
Sea squirts (c)	<i>Cnemidocarpa bicornuta</i>	ASC	153
Sladen's star (s)	<i>Mediaster sladeni</i>	MSL	129
Smooth deepsea anemones (f+)	Actinostolidae	ACS	40
Spider prawns (g)	<i>Nematocarcinus</i> spp.	NEC	97
Spiny serolid isopod (s)	<i>Acutiserolis</i> sp.	ACU	108
Spiny white hydrocorals (g)	<i>Lepidotheca</i> spp.	LPT	50
Squat lobsters (f)	<i>Uroptychus</i> spp.	URP	112
Subantarctic ruby prawn (g)	<i>AcanthePHYra</i> spp.	ACA	99
Sun-star (f)	<i>Crossaster multispinus</i>	CJA	131
Tam O'Shanters (f+)	Echinoidea	TAM	141
Thermiphione scaleworm (g)	<i>Thermiphione</i> (undescribed)	THE	63
Trojan star (s)	<i>Hippasteria phrygiana</i>	HTR	127
Umbrella octopus (g)	<i>Opisthoteuthis</i> spp.	OPI	72
Umbrella urchin (s)	<i>Goniocidaris umbraculum</i>	GOU	138
Volute (f)	<i>Alcithoe larochei</i>	ALL	79
Waite's snake-star (s)	<i>Astrothorax waitei</i>	AWA	148
Warty deepsea anemones (s)	Hormathiidae	HMT	41
Yellow octopus (s)	<i>Enteroctopus zealandicus</i>	EZE	69

Index 2: Taxa listed alphabetically by scientific name. s, species; g, genus; f, family; f+, several families; c, class; o, order.

Common name	Scientific name	Mfish code	Page
Floppy trumpet sponge (s)	<i>Acanthascus (Rhabdocalyptus) sp.</i>	GLS	32
Subantarctic ruby prawn (g)	<i>Acanthephyra spp.</i>	ACA	99
Giant file shell (s)	<i>Acesta maui</i>	AMA	66
Maroon pimpled ear sponge (s)	<i>Aciculites pulchra</i>	APU	30
Smooth deepsea anemones (f+)	Actinostolidae	ACS	40
Spiny serolid isopod (s)	<i>Acutiserolis sp.</i>	ACU	108
Fish biter (s)	<i>Aega monophthalma</i>	AMO	107
Gastropod (c)	<i>Aeneator recens</i>	AER	73
Volute (f)	<i>Alcithoe larochei</i>	ALL	79
Chiton (c)	Amphineura	CHT	64
Black corals (o)	Antipatharia	COB	44
Royal red prawn (s)	<i>Aristaeomorpha foliacea</i>	AFO	92
Scarlet prawn (s)	<i>Aristaeopsis edwardsiana</i>	PED	93
Waite's snake-star (s)	<i>Astrothorax waitei</i>	AWA	148
Gastropod (c)	<i>Austrofusus glans</i>	KWH	74
Deepsea brittle star (s)	<i>Bathypectinura heros</i>	BHE	150
Deepwater octopus (f+)	<i>Benthoctopus tegginmathae</i>	BTE	68
Five-spined star (s)	<i>Benthopecten pikei</i>	BPI	124
Deepsea anemones (g)	<i>Bolocera spp.</i>	BOC	39
Armless stars (s)	Brisingidae etc *	BRG	125
Banded-spine urchin (s)	<i>Caenopedina novaezelandiae</i>	CNO	142
Gastropod (c)	<i>Calliostoma turnerarum</i>	CTN	75
Airy finger sponge (s)	<i>Callyspongia cf. ramosa</i>	CRM	25
Sabre prawn (s)	<i>Campylonotus rathbunae</i>	CAM	94
Pentagon star (s)	<i>Ceramaster patagonicus patagonicus</i>	CPA	126
Golden corals (f)	<i>Chrysogorgia spp.</i>	CHR	47
Sea squirts (c)	<i>Cnemidocarpa bicornuta</i>	ASC	153
Giant sea spiders (s)	<i>Colossendeis spp.</i>	PYC	110
Gastropod (c)	<i>Coluzea mariae</i>	CMR	78
Feather stars (o)	Comatulida	CMT	134
Precious corals (g)	<i>Corallium spp.</i>	CLL	45
Cat's-foot star (s)	<i>Cosmasterias dyscrita</i>	CDY	119
Orange frond sponge (s)	<i>Crella incrustans</i>	CIC	26
Sun-star (f)	<i>Crossaster multispinus</i>	CJA	131
Deepsea urchin (s)	<i>Dermechinus horridus</i>	DHO	139
Crested cup coral (s)	<i>Desmophyllum dianthus</i>	DDI	51
Hermit crab (f+)	<i>Diacanthurus rubricatus</i>	DIR	90
Magnificent sea-star (s)	<i>Dipsacaster magnificus</i>	DMG	121
Tam O'Shanters (f+)	Echinoidea	TAM	141
Deepwater branching coral (f+)	<i>Enallopsammia rostrata</i>	ERO	54
Yellow octopus (s)	<i>Enteroctopus zealandicus</i>	EZE	69
Red hydrocorals (g)	<i>Errina spp.</i>	ERR	49
Bivalve (c)	<i>Euciroa galatheae</i>	EGA	65
Eunice sea-worm (g)	<i>Eunice (undescribed)</i>	EUN	61
Lacey honeycomb sponge (s)	<i>Eurete cf. simplissima</i>	ESI	31
Amphipod (o)	<i>Eurythenes gryllus</i>	EUG	89
Flabellum cup corals (g)	<i>Flabellum spp.</i>	COF	55
Gastropod (c)	<i>Fusitriton magellanicus</i>	FMA	77
Sea slug, nudibranch (o)	Generic nudibranch	NUD	76
Ostrich egg sponge (s)	<i>Geodinella vestigifera</i>	GVE	27
Goblin prawn (s)	<i>Glyphocrangon lowryi</i>	GLO	95

* Includes families Brisingidae, Hymenodiscidae, Novodiniidae, Freyellidae

Index 2—continued

Common name	Scientific name	Mfish code	Page
Parasol urchin (s)	<i>Goniocidaris parasol</i>	GPA	137
Umbrella urchin (s)	<i>Goniocidaris umbraculum</i>	GOU	138
Bushy hard coral (s)	<i>Goniocorella dumosa</i>	GDU	52
Gorgons head basket-stars (g)	<i>Gorgonocephalus</i> spp.	GOR	149
Deepsea kina (s)	<i>Gracilechinus multidentatus</i>	GRM	140
Deepwater octopus (f+)	<i>Graneledone</i> spp.	DWO	70
Jack-knife prawn (s)	<i>Haliporoides sibogae</i>	HSI	106
Trojan star (s)	<i>Hippasteria phrygiana</i>	HTR	127
Sea cucumbers (c)	Holothuroidea	HTH	147
Warty deepsea anemones (s)	Hormathiidae	HMT	41
Quill worm (g)	<i>Hyalinoecia tubicola</i>	HTU	62
Prawn killer (s)	<i>Ibacus alticrenatus</i>	PRK	105
Bamboo corals (f)	Isididae	ISI	48
Sea lilies with cirri (o)	Isocrinida	CRN	135
Spiny white hydrocorals (g)	<i>Lepidotheca</i> spp.	LPT	50
Omega prawn (s)	<i>Lipkius holthuisi</i>	LHO	96
Deepsea anemones (f+)	<i>Liponema</i> spp.	LIP	42
Rock star (s)	<i>Lithosoma novaezelandiae</i>	LNV	128
Madrepora coral (s)	<i>Madrepora oculata</i>	MOC	57
Sladen's star (s)	<i>Mediaster sladeni</i>	MSL	129
Scampi (s)	<i>Metanephrops challengerii</i>	SCI	98
Sea lilies without cirri (o+)	Millericrinida, Cyrtocrinida	CRN	136
Krill, squat lobsters (f)	<i>Munida</i> spp.	MNI	111
Spider prawns (g)	<i>Nematocarcinus</i> spp.	NEC	97
Giant red mysid (s)	<i>Neognathophausia ingens</i>	GNA	109
Deepwater branching coral (f+)	<i>Oculina virgosa</i>	OVI	56
Pentagonal tooth-star (s)	<i>Odontaster benhami</i>	ODT	130
Umbrella octopus (g)	<i>Opisthoteuthis</i> spp.	OPI	72
Deepwater prawns (f+)	<i>Oplophorus</i> spp.	ONO	100
Bubblegum coral (s)	<i>Paragorgia arborea</i>	PAB	46
Microsoft mouse (s)	<i>Paramaretia peloria</i>	PMU	143
Deepwater prawn (f+)	<i>Pasiphaea</i> aff. <i>tarda</i>	PBA	103
Common octopus (f+)	<i>Pinnoctopus cordiformis</i>	OCT	71
Golden prawn (s)	<i>Plesionika martia</i>	PLM	102
Abyssal star (s)	<i>Plutonaster knoxi</i>	PLT	122
Fibreglass cup sponge (s)	<i>Poecillastra laminaris</i>	PLN	29
Deepsea blind lobster (s)	<i>Polycheles suhmi</i>	PSU	104
Deepwater rock lobster (s)	<i>Projasus parkeri</i>	PPA	101
Golden volute (s)	<i>Provocator mirabilis</i>	GVO	80
Rubber sponge (s)	<i>Psammocinia</i> cf. <i>hawere</i>	PHW	28
Fleming's urchin (s)	<i>Pseudechinus flemingi</i>	PFL	146
Geometric star (s)	<i>Psilaster acuminatus</i>	PSI	123
Salps (c)	<i>Pyrosoma atlanticum</i>	PYR	154
Cross-fish (s)	<i>Sclerasterias mollis</i>	SMO	120
Acorn barnacle (s)	<i>Smilium zancleanum</i>	BRN	113
Chubby sun-star (s)	<i>Solaster torulatus</i>	SOT	132
Deepwater branching coral (f+)	<i>Solenosmilia variabilis</i>	SVA	53
Matheson's heart urchin (s)	<i>Spatangus mathesoni</i>	SMT	144
Purple-heart urchin (s)	<i>Spatangus multispinus</i>	SPT	145
Hermit crab (f+)	<i>Sympagurus dimorphus</i>	SDM	91
Long polyp soft corals (g)	<i>Telesto</i> spp.	TLO	43
Thermiphione scaleworm (g)	<i>Thermiphione</i> (undescribed)	THE	63
Squat lobsters (f)	<i>Uroptychus</i> spp.	URP	112
Rat-tail stars (s)	<i>Zoroaster</i> spp.	ZOR	133
Bivalve (c)	<i>Zygochlamys delicatula</i>	ZDE	67

Index 3: Taxa listed alphabetically by Ministry of Fisheries code. s, species; g, genus; f, family; f+, several families; c, class; o, order.

Common name	Scientific name	Mfish code	Page
Subantarctic ruby prawn (g)	<i>Acantheephyra</i> spp.	ACA	99
Smooth deepsea anemones (f+)	Actinostolidae	ACS	40
Spiny serolid isopod (s)	<i>Acutiserolis</i> sp.	ACU	108
Gastropod (c)	<i>Aeneator recens</i>	AER	73
Royal red prawn (s)	<i>Aristaeomorpha foliacea</i>	AFO	92
Volute (f)	<i>Alcithoe larochei</i>	ALL	79
Giant file shell (s)	<i>Acesta maui</i>	AMA	66
Fish biter (s)	<i>Aega monophthalma</i>	AMO	107
Maroon pimpled ear sponge (s)	<i>Aciculites pulchra</i>	APU	30
Sea squirts (c)	<i>Cnemidocarpa bicornuta</i>	ASC	153
Waite's snake-star (s)	<i>Astrothorax waitei</i>	AWA	148
Deepsea brittle star (s)	<i>Bathypectinura heros</i>	BHE	150
Deepsea anemones (g)	<i>Bolocera</i> spp.	BOC	39
Five-spined star (s)	<i>Benthopecten pikei</i>	BPI	124
Armless stars (s)	Brisingidae etc*	BRG	125
Acorn barnacle (s)	<i>Smilium zancleanum</i>	BRN	113
Deepwater octopus (f+)	<i>Benthoctopus tegginmathae</i>	BTE	68
Sabre prawn (s)	<i>Campylonotus rathbunae</i>	CAM	94
Cat's-foot star (s)	<i>Cosmasterias dyscrita</i>	CDY	119
Golden corals (f)	<i>Chrysogorgia</i> spp.	CHR	47
Chiton (c)	Amphineura	CHT	64
Orange frond sponge (s)	<i>Crella incrustans</i>	CIC	26
Sun-star (f)	<i>Crossaster multispinus</i>	CJA	131
Precious corals (g)	<i>Corallium</i> spp.	CLL	45
Gastropod (c)	<i>Coluzea mariae</i>	CMR	78
Feather stars (o)	Comatulida	CMT	134
Banded-spine urchin (s)	<i>Caenopedina novaezelandiae</i>	CNO	142
Black corals (o)	Antipatharia	COB	44
Flabellum cup corals (g)	<i>Flabellum</i> spp.	COF	55
Pentagon star (s)	<i>Ceramaster patagonicus patagonicus</i>	CPA	126
Airy finger sponge (s)	<i>Callyspongia</i> cf. <i>ramosa</i>	CRM	25
Sea lilies with cirri (o)	Isocrinida	CRN	135
Sea lilies without cirri (o+)	Millericrinida, Cyrtocrinida	CRN	136
Gastropod (c)	<i>Calliostoma turnerarum</i>	CTN	75
Crested cup coral (s)	<i>Desmophyllum dianthus</i>	DDI	51
Deepsea urchin (s)	<i>Dermechinus horridus</i>	DHO	139
Hermit crab (f+)	<i>Diacanthurus rubricatus</i>	DIR	90
Magnificent sea-star (s)	<i>Dipsacaster magnificus</i>	DMG	121
Deepwater octopus (f+)	<i>Graneledone</i> spp.	DWO	70
Bivalve (c)	<i>Euciroa galathea</i>	EGA	65
Deepwater branching coral (f+)	<i>Enallopsammia rostrata</i>	ERO	54
Red hydrocorals (g)	<i>Errina</i> spp.	ERR	49
Lacey honeycomb sponge (s)	<i>Eurete</i> cf. <i>simplissima</i>	ESI	31
Amphipod (o)	<i>Eurythenes gryllus</i>	EUG	89
Eunice sea-worm (g)	<i>Eunice</i> (undescribed)	EUN	61
Yellow octopus (s)	<i>Enteroctopus zealandicus</i>	EZE	69
Gastropod (c)	<i>Fusitriton magellanicus</i>	FMA	77
Bushy hard coral (s)	<i>Goniocorella dumosa</i>	GDU	52
Goblin prawn (s)	<i>Glyphocrangon lowryi</i>	GLO	95
Floppy trumpet sponge (s)	<i>Acanthascus (Rhabdocalyptus)</i> sp.	GLS	32
Giant red mysid (s)	<i>Neognathophausia ingens</i>	GNA	109

* Includes families Brisingidae, Hymenodiscidae, Novodiniidae, Freyellidae

Index 3—continued

Common name	Scientific name	MFish code	Page
Gorgons head basket-stars (g)	<i>Gorgonocephalus</i> spp.	GOR	149
Umbrella urchin (s)	<i>Goniocidaris umbraculum</i>	GOU	138
Parasol urchin (s)	<i>Goniocidaris parasol</i>	GPA	137
Deepsea kina (s)	<i>Gracilechinus multidentatus</i>	GRM	140
Ostrich egg sponge (s)	<i>Geodinella vestigifera</i>	GVE	27
Golden volute (s)	<i>Provocator mirabilis</i>	GVO	80
Warty deepsea anemones (s)	Hormathiidae	HMT	41
Jack-knife prawn (s)	<i>Haliporoides sibogae</i>	HSI	106
Sea cucumbers (c)	Holothuroidea	HTH	147
Trojan star (s)	<i>Hippasteria phrygiana</i>	HTR	127
Quill worm (g)	<i>Hyalinoecia tubicola</i>	HTU	62
Bamboo corals (f)	Isididae	ISI	48
Gastropod (c)	<i>Austrofuscus glans</i>	KWH	74
Omega prawn (s)	<i>Lipkius holthuisi</i>	LHO	96
Deepsea anemones (f+)	<i>Liponema</i> spp.	LIP	42
Rock star (s)	<i>Lithosoma novaezelandiae</i>	LNV	128
Spiny white hydrocorals (g)	<i>Lepidotheca</i> spp.	LPT	50
Krill, squat lobsters (f)	<i>Munida</i> spp.	MNI	111
Madrepora coral (s)	<i>Madrepora oculata</i>	MOC	57
Sladen's star (s)	<i>Mediaster sladeni</i>	MSL	129
Spider prawns (g)	<i>Nematocarcinus</i> spp.	NEC	97
Sea slug, nudibranch (o)	Generic nudibranch	NUD	76
Common octopus (f+)	<i>Pinnoctopus cordiformis</i>	OCT	71
Pentagonal tooth-star (s)	<i>Odontaster benhami</i>	ODT	130
Deepwater prawns (f+)	<i>Oplophorus</i> spp.	ONO	100
Umbrella octopus (g)	<i>Opisthoteuthis</i> spp.	OPI	72
Deepwater branching coral (f+)	<i>Oculina virgosa</i>	OVI	56
Bubblegum coral (s)	<i>Paragorgia arborea</i>	PAB	46
Deepwater prawn (f+)	<i>Pasiphaea</i> aff. <i>tarda</i>	PBA	103
Scarlet prawn (s)	<i>Aristaeopsis edwardsiana</i>	PED	93
Fleming's urchin (s)	<i>Pseudechinus flemingi</i>	PFL	146
Rubber sponge (s)	<i>Psammocinia</i> cf. <i>hawere</i>	PHW	28
Golden prawn (s)	<i>Plesionika martia</i>	PLM	102
Fibreglass cup sponge (s)	<i>Poecillastra laminaris</i>	PLN	29
Abyssal star (s)	<i>Plutonaster knoxi</i>	PLT	122
Microsoft mouse (s)	<i>Paramaretia peloria</i>	PMU	143
Deepwater rock lobster (s)	<i>Projasus parkeri</i>	PPA	101
Prawn killer (s)	<i>Ibacus alticrenatus</i>	PRK	105
Geometric star (s)	<i>Psilaster acuminatus</i>	PSI	123
Deepsea blind lobster (s)	<i>Polycheles suhmi</i>	PSU	104
Giant sea spiders (s)	<i>Colossendeis</i> spp.	PYC	110
Salps (c)	<i>Pyrosoma atlanticum</i>	PYR	154
Scampi (s)	<i>Metanephrops challengerii</i>	SCI	98
Hermit crab (f+)	<i>Sympagurus dimorphus</i>	SDM	91
Cross-fish (s)	<i>Sclerasterias mollis</i>	SMO	120
Matheson's heart urchin (s)	<i>Spatangus mathesoni</i>	SMT	144
Chubby sun-star (s)	<i>Solaster torulatus</i>	SOT	132
Purple-heart urchin (s)	<i>Spatangus multispinus</i>	SPT	145
Deepwater branching coral (f+)	<i>Solenosmilia variabilis</i>	SVA	53
Tam O'Shanters (f+)	Echinoidea	TAM	141
Thermiphione scaleworm (g)	<i>Thermiphione</i> (undescribed)	THE	63
Long polyp soft corals (g)	<i>Telesto</i> spp.	TLO	43
Squat lobsters (f)	<i>Uroptychus</i> spp.	URP	112
Bivalve (c)	<i>Zygochlamys delicatula</i>	ZDE	67
Rat-tail stars (s)	<i>Zoroaster</i> spp.	ZOR	133